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PREPARATION FOR THE 1990 FARM BILL

HEARINGS

BEFORE THE

SUBCOMMITTEE ON
CONSERVATION AND FORESTRY

OF THE

COMMITTEE ON AGRICULTURE,
NUTRITION, AND FORESTRY
UNITED STATES SENATE

ONE HUNDRED FIRST CONGRESS

FIRST AND SECOND SESSIONS

ON

CONSERVATION ISSUES AND AGRICULTURAL PRACTICES AND
OVERSIGHT ON THE FORESTRY TITLE OF THE 1990 FARM BILL

JUNE 22, 1989; MARCH 1 AND 29, 1990

PART XI

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PREPARATION FOR THE 1990 FARM BILL

Review Conservation and Agricultural Practices

THURSDAY, JUNE 22, 1989

U.S. Senate,
Subcommittee on Conservation and Forestry of the
Committee on Agriculture, Nutrition, and Forestry,
Washington, DC.

The subcommittee met, pursuant to notice, at 9 a.m., in room SR-332, Russell Senate Office Building, Hon. Wyche Fowler, Jr. (chairman of the subcommittee) presiding.

Present or submitting a statement: Senators Fowler, Pryor, Baucus, Kerrey, Bond, and Gorton.

STATEMENT OF HON. WYCHE FOWLER, JR., A U.S. SENATOR FROM GEORGIA

Senator **Fowler**. Good morning. My name is Wyche Fowler. Joining me is the Senator from Washington, Mr. Gorton, and we welcome you to this hearing on soil conservation.

As we attempt to examine American agriculture from every angle, we too often overlook the most fundamental basis of agricultural production, which is the condition of our soil. I suppose the best commodity and marketing programs won't do us much good if we do not maintain enough fertile farmland to supply our needs, and sustain it for future use.

We learned some lessons in the 1970's, that there is nothing more important than plain old dirt for our agricultural survival. In those days, as most of you know, the Government urged everybody to plant fence row to fence row. Many farmers plowed up their conservation structures. They employed the most intensive agricultural and farming methods. Certainly these practices did boost production, as the Government had urged—temporarily, anyway. These practices also produced record erosion levels that we, as responsible stewards of the land, could not tolerate—and which our farmlands could not physically sustain.

There has never been, at least in my 13 years in the Congress, so much public interest in the interrelationship between agricultural, environmental, and health issues as we have today. Our citizens are concerned about maintaining our natural resources, including our agricultural resources. They also perceive this as a health issue since the treatment of our soil affects the food they eat and the water that we drink.

Awareness of these needs and concerns is increasing throughout the agricultural sector. Advances are being made, and we are going to hear about a lot of those this morning, in best management practices, integrated pest management, and low-input sustainable agriculture. There is a great deal of promise in the field of biotechnology, to produce strains of crops that are pest resistant and require less irrigation and fertilization.

Farmers, of course, are more interested than anybody in experimenting with ways to improve their stewardship of the soil and cut costs at the same time. This often involves time-tested methods of crop rotation and conservation tillage. The use of shelterbelts and other simple conservation structures has proven beneficial for our farmland also, at little cost.

We certainly cannot afford to continue with practices and policies that degrade our natural resources. Overreliance on fertilizers and farm chemicals can produce erosion and loss of soil fertility—which puts production at risk in the long run. Overly intensive farming has led to the clearing of forest land and tree buffers that protect our water supplies. We are currently losing one-half million acres of wetlands a year. Ultimately the loss of these and other fragile lands has an adverse effect on the condition and fertility of all of our farmland.

We need to examine these problems and many others. That is why we are here this morning. What are the obstacles to overcome addressing these issues as a matter of public policy? That is why we are here, and I know that I will learn much in the course of this morning's testimony from a wide variety of sources and witnesses.

I am pleased to have Senator Slade Gorton with us. Do you have anything you would like to say?

Senator GORTON. No opening statement, Mr. Chairman.

Senator FOWLER. Thank you. Without objection, the prepared statement of Senator Pryor will be received and entered into the hearing record at this point.

[The prepared statement of Senator Pryor follows:]

PREPARED STATEMENT OF HON. DAVID H. PRYOR, A U.S. SENATOR FROM ARKANSAS

I want to begin by praising Senator Fowler for his early leadership in considering agriculture's relation to the environment. Senator Fowler and his staff have explored innovative possibilities in an effort to address this topic, which is sure to be one of the most time consuming titles of the 1990 farm bill. The fact that the U.S. consumer has a concern about the quality of our ground water as well as the rest of our environment is reason enough for this committee to attempt to determine how warranted this concern might be.

The Agriculture Committee has a dual responsibility when it comes to the subject of ground water: we are obligated to see that the safety of our ground water supply is protected; we should be just as committed to see that our farmers are protected from being subjected to constraining regulations that could negatively impact their yields—all in the name of achieving a cleaner environment—yet later finding out that these new mandates had proven unnecessary. My point is simple—I do not oppose a gradual reduction in our farmer's dependence on the use of chemicals, but I believe that any steps the government takes to influence such a move should be supported by scientific evidence.

The committee already has before it three bills that deal with the issue of our ground water and conservation practices in general. I am glad to see Senator Fowler taking the initiative in beginning the debate which will formulate the conservation title of the next farm bill. It is my hope that each piece will receive complete attention and consideration, because there appear to be many good, solid proposals contained within these bills which could in the end be the basis of a very sound conservation title which would maintain a balance between the environment and the farmer.

Protection of ground water is one of the most important issues facing American agriculture today. We can prevent many of our Nation's environmental problems right from the start by implementing legislation that is supported by scientific research, and by being certain that such legislation is responsible in that it fully addresses the issue without falling short. Agronomic best management practices is an important initial step in this direction; the challenge before us is to determine which approach will prove to be the best choice as a second step.

Senator FOWLER. Ladies and gentleman, you may have the witness list. I am just going to take one out of order here, in the spirit, rightly or wrongly, of the Supreme Court decision.

We have with us this morning a man, Mr. Edward Goldsmith, an Englishman. He edits and produces a magazine called "The Ecologist" in England. He has written on farming and conservation and ecological issues for some 25 years. He has been honored in his own country. He was in this country, so I invited him to testify today.

I am giving him this unusual introduction because I have heard him speak, and what he is about to say many of you will not have heard before, in that it is, needless to say, a different view of modern agriculture than most of us have assumed and most of us have followed. We will hear from him and then there will be 3 hours of rebuttal. [Laughter.]

Mr. Goldsmith, if you will come here, we will lead off with you.

STATEMENT OF EDWARD GOLDSMITH, EDITOR, THE ECOLOGIST, ENGLAND

Mr. GOLDSMITH. Thank you, Mr. Senator.

COMMENTS ON THE GLOBAL PROBLEM OF FEEDING THE WORLD

I just want to say a few words about the global problem of feeding the world. The present strategy is to modernize food production through the introduction of HYV's—high yielding varieties—fertilizer, pesticides, irrigation—the whole package. This is justified on the grounds that famine is largely due to archaic agricultural practices with low yields, and also in that this contributes to economic development which is required so that the food requirements of the poor can be translated into "effective demand".

I don't accept either of these arguments. Traditional agriculture was quite satisfactory. We are judging it today in terms of the wrong criteria: cereal yields, for instance. But we forget all the food traditional people once produced—food crops of all sorts—vegetables, root crops. The food they derived from wildernesses that are no more wild plants, fruit and berries, game, fish, et cetera. Also we are looking exclusively in terms of yields and not in terms of the sustainability of food producing practices. We are only now beginning to accept that modern agriculture is not sustainable. It causes soil erosion, salinization, desertification at an intolerable rate. Once we really try to make our agriculture sustainable we will also have to reduce yields considerably.

The traditional people reduced vulnerability to climatic [illegible] vast numbers of different strains of different planting varieties of a given crop. In India, for instance, Dr. Richerria of Bhopal has collected 10,000 different varieties of rice—10,000, that is a lot of varieties—between them they could cater for all possible climatic and soil conditions and changes.

Traditional people didn't have money. To say that they are starving now because they don't have money is wrong since they never did have money to buy their food. They produced their own food. They lived largely in a noncash economy and they didn't starve. In fact, if you look at your figures, you will see that most Third World countries were self-sufficient in food until the last decades. They have become, since then, tremendously dependent on Western food imports.

I can't go into the whole question of the market. I must restrain myself to the issue of the modernization of agriculture, and I am going to give you three reasons why it cannot feed the world.

THREE REASONS WHY MODERNIZATION OF AGRICULTURE CANNOT FEED THE WORLD

The first is that it is uneconomic. Third World people can't afford it. Fertilizers, pesticides, and irrigation water, which are required to implement the "Green Revolution," are just too expensive. Dams to provide the irrigation water can cost up to $1,000 million. Irrigated land can cost $20,000 to $25,000 a hectare. No Third World peasants can afford this.

It has to be subsidized by the state because it is uneconomic. According to the World Resource Institute the revenue from world irrigation systems provides 10 percent of the cost of construction, maintenance, and operation of these irrigation systems. Ninety percent has to be subsidized, so it is not altogether surprising that the Third World that has spent $250 billion on dams since the war, should be so preposterously indebted.

It is possible that one-quarter of the Third World debt, which we all rightly regard as an almost insuperable problem, has been contracted in order to implement the Green Revolution and in particular to pay for irrigated agriculture.

The same thing has happened in America, to a certain extent. According to my information, your farmers here are also badly in debt because modern agriculture is just too costly. If my figures are correct, your farmers owe something like $300 billion to the banks, much of which they can't pay.

The second reason why the modernization of agriculture can't feed the world is that, since Third World countries have to borrow money to modernize agriculture, they have to earn the money to pay the interest on the money borrowed. Even if they don't pay the capital back, they still have to pay interest. How do they do that? Well, unfortunately there is only one thing they can do, unless they happen to have oil or copper or something of the sort, and that is to export the produce of their soil.

Now there is no point in just killing yourself to get a high yield if you are going to export the food in order to feed cattle in America and Europe. Yet, in many Third World countries, 50 to 70 percent of the good land is being used for producing food for exports—much of it to feed cattle.

This is one of the major causes of malnutrition and famine in the Third World today. Indeed either people eat their food or they export it. They cannot do both.

It might be argued that they can import their food, but the food they import tends to be second-rate stuff, processed food which is nutritionally not the equivalent of what they are exporting, and in any case it goes mainly to the city folk, to the Army, the bureaucracy, the politicians, the people in the cities, and doesn't get to the peasants, who cannot afford to buy it. They are just going to starve if they don't produce their own food.

The third and final reason why the modernization of agriculture cannot possibly feed the world is that it is extremely destructive to the soil. This you can see for yourselves in America.

I taught a course in a university in Illinois about 6 years ago—the soil was going there at the rate of knots. In 40 years there would be no topsoil at the rate at which it was going. Look at what is happening to the southern part of your central valley of California, the San Joaquin Valley. It is becoming a salt desert. Look at what is happening in the Southwest, in Texas and Arizona, where the aquifers are being depleted and where highly productive irrigated lands are going to become second-class rangelands in a matter of decades.

If modern agriculture is destroying your food-producing capacity in America, imagine what it does in the Third World where the soils are usually extremely poor, with a very low organic content and hence very vulnerable to erosion, and also very vulnerable to salinization, because of the salts it usually contains, which are brought up to the surface under a regime of perennial irrigation.

The destruction of the soil is particularly bad in Africa, so much so that we are witnessing the death throes of an entire continent, something that has never happened before.

The same thing is happening in India where I spend about a month every year. The soil in India is going. The country is dying. The rivers and the springs are drying up. Every year hundreds of villages that had water the year before don't have it any more. The country is dying. It is being killed by deforestation and the adoption of the wrong type of agriculture.

THE ONLY POSSIBLE WAY OF FEEDING THE WORLD IS TO RETURN TO A TRADITIONAL TYPE OF AGRICULTURE

Now this is something that cannot go on. I personally feel that the only possible way of feeding the world is to return to a traditional type of agriculture, geared to subsistence, and to the satisfaction of local markets. I think this is the only possible means of feeding the world.

Interestingly enough, a few years ago in Tanzania we were hearing that people were eating for the first time, and the reason they were eating was that their economy was in such bad shape. There was no money to buy inputs for agriculture, no money to repair the roads, so they couldn't use modern agriculture and they couldn't export their food. So they ate their food, and for the first time in many years they were well-fed.

Thank you.

Senator **Fowler**. Thank you, Mr. Goldsmith. We invite you to stay and participate in the rest of the hearing.

Mr. **Goldsmith**. Thank you very much.

Senator **Fowler**. Now for a less frightening view, Dr. Charles Hess, Assistant Secretary for Science and Education, the U.S. Department of Agriculture in Washington.

Good morning, Dr. Hess. You may proceed as you will. If you could summarize your testimony, as you know, that would be very helpful to us. It will be made a part of the record and leave us plenty of time for questions.

Mr. **Hess**. Thank you, Mr. Chairman. I would like to have the statement incorporated into the record.

Senator **Fowler**. It will be.

Mr. **Hess**. Fine. Thank you.

Senator **Fowler**. Thank you.

STATEMENT OF CHARLES E. HESS, ASSISTANT SECRETARY FOR SCIENCE AND EDUCATION, U.S. DEPARTMENT OF AGRICULTURE, WASHINGTON, DC

INTRODUCTION

Dr. **Hess**. I am pleased to have the opportunity to address the agricultural production and conservation methods of the present and also the future.

Agriculture does have many aspects, almost as many aspects as there are people who are practicing it. There are full-time farmers and those who engage in farming part-time. There are farmers who subscribe to conventional technologies and those who hold to practice organic methodologies, and there are many in between that spectrum.

It is within this context of this system that the U.S. Department of Agriculture (USDA) operates to provide the agricultural producer with the information, techniques, and technology to successfully complete the job of agriculture as he or she sees it.

AGRICULTURAL SYSTEMS TODAY ARE A FUSION OF PRODUCTION AND CONSERVATION PRACTICES

Agricultural systems today are a fusion of production and conservation practices. In the case of what has come to be called conventional agriculture, marked technological advances have been made in equipment, germ plasm, fertilizer formulations, pesticides, irrigation techniques, and market development. There has been at the same time, a growing recognition of the need to conserve soil, water, and related resources to sustain food and fiber production and enhance the environment. Over the period since World War II, conservation technology has been developed in conjunction with advances in production technology.

Today, the technologies of conservation and production are applied to the land in the form of systems which manage resources for both purposes. These systems are composed of vegetative, structural, and management practices. Conservation tillage and filter strips are examples of vegetative practices. Some of the structural practices used are terraces (gradient, tile-outlet, contour), water and sediment control basins, and diversions. Management practices include nutrient and pesticide management.

CONVENTIONAL AGRICULTURE OF TODAY IS NOT THE CONVENTIONAL AGRICULTURE OF EVEN 5 YEARS AGO

The conventional agriculture of today is not the conventional agriculture of even 5 years ago. Technology and science have moved forward and created new opportunities and new awarenesses.

Conventional agriculture of the past generally held that fields should be tilled and left with all organic residues plowed under. The rise of conservation tillage practices is testimony to the appreciation by the producer of the multiple benefits which can be derived from new technology.

GREAT STRIDES HAVE BEEN MADE IN RECENT YEARS

Great strides have been made in recent years in the development of pesticides which are less harmful to the environment. There has also been significant improvement in the technology and practice of integrated pest management, and one of our challenges is to get our growers to adopt those technologies.

A LOOK TO THE FUTURE

What do we see for the future? Probably the most obvious differences will be in the appearance of the land and the machines which will be used on it. If the past is prologue to the future, then there will be increasing use of some form of conservation tillage. More crops will be grown under conditions of high crop residue than are being grown now. Cotton, for example, will be grown in residues from the preceding crop. Planters will be able to sense microdifferences in soil clay and organic matter and will be able to place fertilizer in proper amounts and depths within the soil to optimize yield, using computer technology and sensing. There will be more machinery which will be used to remove pest infestations without the dependency on agricultural chemicals. These past 2 years in California the "bug vac" machines have been used for both strawberries and lettuce, to literally suck the bugs off the crops and reduce the dependency on pesticides.

Whole-field composting—a refinement of residue use—will become an acceptable practice by which organic matter can be incorporated into the soil, and plant nutrients recycled. Certain genetic breakthroughs could radically change agricultural systems. This year, for example, in Mississippi we will be field-testing a genetically modified cotton plant which has a gene from the bacteria Bacillus thuringiensis to give it pest resistance. I think, again, this striving to get genetic resistance to disease and insects then reduces our dependency upon agricultural chemicals, which then reduces the chance for contamination of ground water.

Our knowledge of the soil and agriculture has shown us that certain conventional methodologies are timeless. Among the conservation practices which will continue to be needed in the future are crop rotations, contour cultivation, strip cropping, and their various combinations.

Management practices are dependent upon knowledge. However, before there can be knowledge, there must be a need to know or an appreciation of the need to know. Producer education in the ways in which nutrients and pesticides move in soil, how soil moisture interacts with them, and how they can be managed within the context of the agricultural system, will grow in importance. This knowledge will create better management decisions. That places, I think, a good challenge on Cooperative Extension to help get that information to the user, and also to help them appreciate why that information is important.

Current work in the field of low-input sustainable agricultural (LISA) systems has verified the fact that diversified systems do have greater resilience to the vagaries of nature and market. These conventional conservation practices that I have mentioned are basic to any LISA system. Of equal importance is effective and efficient nutrient management. What is likely to happen is the evolution of social/business institutions such as "nutrient cooperatives." Just as cooperatives now exist to provide market leverage to the benefit of members, members of such a nutrient cooperative would cooperate to the production advantage of its members. Crop producers practicing crop rotation would possibly be able to supply livestock growers in the cooperative with forage in return for animal waste and bedding which would be returned to the land. This would represent sort of a total systems approach, sometimes on an individual farm, but where that is not possible, then in a cooperative venture.

THERE ARE SOME OBSTACLES TO THE ADOPTION OF THE NEW, ENVIRONMENTALLY SAFE CONSERVATION AND PRODUCTION METHODS

There are some obstacles to the adoption of the new, environmentally safe conservation and production methods which you asked us to address. I will mention a few. One is the lack of information about the extent of the problems arising from present methods. I think that there has been much growing awareness of the movement of chemicals in the soil, and that is because we have better techniques to measure them now and track them. Formerly, where people felt that if you added something to the soil it would be fixed or biodegraded, we now realize that that is not the case and we have to adapt techniques to mitigate that.

Coupled with the lack of basic information about the extent of the problem is a shortage of research information which addresses technology needed to respond to problems where they do exist. We need to develop economically viable production practices which avoid or minimize pollution from agriculture. This is not an easy or a short-term task.

There is also a lack of information among producers about known means to reduce risks to the environment from agricultural production. Education and technical assistance programs need to be enhanced to help make sure that the best available technology, which is economically feasible, is adopted. This is a key element in the USDA's approach to such environmental concerns as water quality.

There are also institutional obstacles to the adoption of environmentally safe production methods. An example is farm program base acreage requirements which reduce producer flexibility and encourage monoculture while limiting crop rotations. As mentioned earlier, crop rotations can have beneficial environment effects by reducing the need for pesticides and off-farm sources of nutrients.

In addition, there is a need to better coordinate the work and programs among the many Federal, State, and local organizations and the private sector involved in researching and promoting environmentally safe production practices.

AN EXAMPLE OF HOW WE ARE TRYING TO ADDRESS SOME OF THESE CONSTRAINTS

Finally, let me discuss briefly an example of how we are trying to address some of these constraints. This particular example concerns water quality.

First, a little background: In the 1990 budget proposal presented to the Congress on February 9, 1989, President Bush included an initiative on enhancing water quality.

In his statement of principles and policies, the President makes it clear that farmers are ultimately responsible for avoiding contamination of water resulting from management practices they apply to the landscape. He also stated that it was the role of the USDA to conduct research and provide education and technical assistance to help producers fulfill their responsibilities and obligations by providing and demonstrating "farming practices that avoid water quality degradation," and that are economically viable.

The USDA and cooperating State institutions accept the challenge and the responsibilities for their part in the President's initiative. A multiagency, multidisciplinary plan has been developed with the following goals: to assess the seriousness and extent of agriculture's impact on water quality, with an emphasis on ground water; and to develop and promote the voluntary adoption of new and improved agricultural management systems that are cost-effective and enhance water quality by demonstrating their contributions to farm profitability and competitiveness.

These goals will be addressed and coordinated through integrated efforts by the USDA and other Federal and State agencies. The work will be instrumental in removing obstacles to the development and adoption of environmentally safe practices. There will be three major program areas:

One is research and development, to initiate and expand our research to improve our understanding of water contaminant sources and processes. Prove new and improved agricultural and forestry management practices that reduce the chance of water resource degradation. Determine the socioeconomic impacts of current and new management practices on the farm, community, and regional basis, and measure the cost-effectiveness of these new practices.

The second is education and technical assistance to enhance water quality by developing and demonstrating new and improved production management practices from already available research results and from new techniques developed under the research and development program under the first part. Accelerate activities to encourage adoption of these practices to reduce or prevent contamination where agricultural nonpoint source pollution of ground water or surface water has been identified as a current or potential concern.

Third, data base development, to enhance the collection and distribution of data on the use of agricultural chemicals and related cropping practices and soil characteristics. We want to improve the data management activities to assist decisionmakers in addressing issues related to water resources, especially the effects of agricultural chemical use on water quality.

In California we have a system whereby, before a farmer can apply a registered chemical, he has to notify the county agricultural commissioner and get clearance, so then there is a record of every registered pesticide that is used on each piece of farmland. You can then go back in the history and see what has been put on that soil. It provides a very important record in case there are problems, particularly involving water quality.

Actions taken under this initiative will lead to substantial reduction in the contamination of U.S. water resources by agricultural chemicals and wastes, if the programs and practices developed and demonstrated by the USDA and its Federal and State partners are accompanied by national agricultural policies that allow and encourage their adoption. Ongoing research, education, and technical assistance programs will continue to provide information in support of voluntary adoption of improved, cost-effective production practices to protect and enhance the quality of the Nation's water resources.

We believe that the water quality initiative will demonstrate that the Department and its partners in the private sector and Federal, State, and local government can develop and implement cost-effective technologies to sustain a profitable and environmentally safe agriculture. We believe it can be used as a model to address other emerging environmental issues such as global climate change.

Thank you very much, Mr. Chairman. I will be glad to answer any questions.

Senator FOWLER. Mr. Secretary, thank you very much for your participation and also for the detail of your testimony. I have a lot of questions, as you might imagine, but in the interest of time I am going to submit most of them for the record and we will get some correspondence going, but I have written out two or three areas that I want to discuss with you briefly, especially in light of your testimony.

The ARS, CSRS, Extension Service, SCS, are all involved in programs concerning water quality, biocontrol, pesticide application training, conservation, agricultural practices, and the like. To a large extent it seems there appears a large number of separate programs with separate pots of money, without any overall coordinating drive or strategy.

You mentioned the multiagency effort that is now underway, but a multiagency effort is by its nature separate Hydra-like heads, sometimes facing the same direction and sometimes facing toward Scylla and Charybdis, as they float toward the destructive rocks. Isn't there a strong case to be made for bringing all of these programs together under something we will call a sustainable agricultural research and extension program, headed by a fine Assistant Secretary for Science and Education? [Laughter.]

Dr. HESS. Mr. Chairman, what we have done in the case of the water quality is, Deputy Secretary Robert Long has served as the coordinator of the program and has brought the members of the various agencies together to jointly plan the water initiative. I think that that does give us a very good working model, and I would like to try and build on that successful model to achieve the coordination that you are rightly concerned about.

Senator FOWLER. But it is a fair, I did make a fair—I am not trying to put words in your mouth, you will tell me if you agree or disagree—but it is a fair assessment that now we do not seem to have a coordinated strategy in these areas, and that we are having each agency come. I know that because I also sit on the Subcommittee on Agriculture and Related Agencies of the Committee on Appropriations, where we have each of these agencies coming for the usual, separate little piece of the pie. I just haven't seen yet where all of this is going to come together. I want your assurances, and I want you to convince me.

Dr. HESS. I have been here for about a month——[Laughter.]

Dr. HESS [continuing]. And I do not know for sure that there is the problem, but I recognize there is the perception of a problem and I have to deal with that perception. It is my goal to provide coordination, certainly with the groups that are within my responsibility—the Extension Service, ARS, CSRS, and the National Library. We are meeting together to discuss our proposals for the 1991 budget and we will coordinate those.

In terms of the other agencies, I think that the model that I have described is one that I would like to try, in which there is a lead agency responsibility, drawing up on the expertise base of the Department and coordinating the planning and budget development for a particular area, recognizing that once that planning is done and once you have approved a budget, then the implementation of that is carried on by the individual agencies, and recognizing that there needs to be continued monitoring and coordination as that implementation goes through, but I think it can be done. I would like to try it.

Senator FOWLER. Well, I am delighted to be in at the beginning and as a participant in your baptism——[Laughter.]

Senator FOWLER [continuing]. Because I believe it can be done. I believe it should. There are a lot of us, even those ghosts around the table, who believe it can be done.

But let's get off of planning and budgeting and the efforts at coordinating the bureaucracies for just a couple of specifics that in your new position, Dr. Hess, I wish we could have some attention.

The President, as you stated and we all applaud, has proposed this water quality initiative. Again, in his program—and not to go back to that—he has new spending slated for all those that I mentioned, ARS, CSRS, ES, SCS, every acronym around. We have these tight budgets that he and you and I would all acknowledge. We are trying to get a big bang for the buck in any new initiative that we undertake, because of our spending difficulties.

There are clearly research and monitoring needs in the ground water and surface water areas that you described in your testimony, but we also need to be dealing directly with the contamination, now and in the immediate future, caused by the combination of things that are getting into our water. In other words, the one thing that seemed to be missing in the accounts of our new water quality initiative is prevention.

I don't have to give a lecture to you or anybody else that if we have prevention, that means less cleanup needs in the future, lower long-term costs, and if we direct our attention—a substantial part of this research and development and all those things that you mentioned—to prevention, we will probably achieve a much better balance between more research and the express need of our farmers for action now. How do you react to that?

Dr. Hess. I certainly agree. Part of the water quality initiative does include some major demonstration areas where known technology will be applied to reduce the impacts, and really directed to prevention.

The other one I think that we need to work on, as I mentioned in my testimony, is convincing the farmers to use some of the existing technology. I will use integrated pest management as an example.

Senator Fowler. Well, let me interrupt you. Again, we just use this as part of the baptism, to get used to being interrupted all the time. But specifically, when you say convincing the farmers, I haven't found that to be the case. This is one man talking, but what I want to know from your side for the moment is, does the Extension Service now have any plans to provide farmers with the information and assistance that is already available to protect water quality?

I have not found it, this question that always seems to arise in Washington, about how do we convince farmers to protect their own water, for goodness sakes, their drinking water, from contamination. What they say is, what they tell me and my colleagues around the table is, "Tell us how to do it." They are the ones that have the most at stake in not having a poisoned well.

Are there any plans of the Service specifically to provide this kind of information that now is presently available on water quality and how they can prevent water well contamination?

Dr. Hess. The answer is yes, but let me give you an example of the case I was trying to make.

Senator Fowler. Dr. Hess, this is the Senator from Montana, Mr. Baucus, who has joined us.

Dr. Hess. Hello, Senator Baucus.

Senator Baucus. Good to see you, Dr. Hess.

Dr. Hess. Good to see you.

Let me give you an example. If I may, I will draw upon one from California because that is where I am most familiar with it.

We have integrated pest management systems that have been developed for controlling insects on tomatoes and almonds, as an example. Let me stick to the tomato example. We know, by using that system which involves monitoring the field so that you only apply a pesticide when the insect level reaches a point where it becomes economically threatening, and we also have biological control methods, we can demonstrate that we can reduce 20 percent of the need for pesticides for that.

Now the problem is——

Senator **Fowler**. Twenty percent of the use of the pesticides by the timing of their use?

Dr. **Hess**. By more accurate timing and by the use of materials which do not affect beneficial insects, so it is a total program, and that results in the saving of millions of dollars. Yet not all growers are willing to adopt it at this point, because part of their concern or part of their rationale is that they know if they use their conventional practices, they can get absolute control over the insects, which means that when they bring the tomatoes to the processor, their load of tomatoes will not be rejected because it contains more than, say, 2 percent of a worm content. If they go higher than that, then it is rejected by the processor.

So they know this other technique is there and it can reduce their costs somewhat, but there is a risk. There is a risk that they may not have their product accepted, so they are in a decision mode as to whether to use the integrated pest management technique or a known, absolutely reliable technique which we know is not environmentally safe.

I think what is happening now, of course, is that the great consumer concern for residues, things like proposition 65 in California affecting water quality now are forcing the grower to know that the risk of adverse effects on the environment, adverse effects in terms of public response to their product, is probably greater than the risk of having their crop rejected. Or the other thing that we may have to do is to have the consumer and the processor accept a little more content of insects, for example, in the product. It is, after all, protein too. These are some of the things——

Senator **Fowler**. If I said that, they would run me out of Georgia. I'm glad this is the administration saying that.

Dr. **Hess**. This is an example of where we need a continued process of education. What happens I think that is most successful is by having demonstration areas where growers who are recognized as leaders accept the practices, show that there are economic gains, and then other growers come along and say, "Well, yes, that's a good idea. We will adopt that as well."

So in answer to your question, yes, Cooperative Extension is working very hard to get existing technology implemented which can in fact reduce the negative impacts of agriculture on the environment, but it is a big challenge.

Senator **Fowler**. I am going to ask just one more question, Dr. Hess, and then let Senator Baucus, and Senator Bond from Missouri, who has joined us, let them have their time.

I had almost decided not to mention this to you publicly, but in light of your statement—and another thing, if I say it publicly, maybe it will help us all look into it a little bit better.

Every single request—again going over to my appropriations hat for a minute—every appropriations request that we have had this year from farmers and farm groups has involved—and I went and had the staff check it—every request has involved food safety or some environmentally sound agricultural practice, whether it is for education, research, or application of existing practices such as the ones that you just described. This ranges from IPM to the low-input strategies.

The only thing I can interpret from that, since the responsible organizations are representing the farmers, is that this is the message coming up from the ground, and that message is clear: They want more research and information and education in environmentally safe agricultural practices because the grower recognizes that the consumer's confidence is crucial.

I introduced this little bill that you know about, though I am sure you haven't had a chance to be familiar in detail, which encourages voluntarily the use of low-input strategies. It doesn't say do away with all the chemicals and fertilizer. It doesn't say anything like that. It just says, "Look, here are some techniques. We are not going to penalize you on your base acreage. We are not going to penalize you on discrimination on crop insurance. We are going to encourage you to try some of the latest techniques, education, that sort of thing."

But a prime example of what the extension service is now doing is—or at least their lack of coordination with State and field offices—as soon as I introduced it, I was criticized by many of them, including in my own State, for offering, simply offering an initiative on low-input agriculture. You have your Washington office—not you, but you are going to be, as soon as we are through your baptism—you have the Washington office going around with the President of the United States promoting low-input and asking all of us to take advantage of what we have already learned and to put money into research and development, while the State specialists in many cases, including my own, are denouncing it.

I'm sure you will agree that we can't encourage farmers to try these new methods, whether it be IPM, BMP, low-input, when you have people in the Department of Agriculture, especially the specialists, telling farmers there is nothing to it. I hope you will look into that.

Dr. HESS. I will.

Senator FOWLER. That's all I need to know.

The Senator from Montana.

Senator BAUCUS. I thank the chairman.

Dr. Hess, as you know, different parts of the country have different growing conditions, different range conditions, and it is for that reason that we have the experiment/research stations all around the country. Briefly, there are two I would like to talk to you about in our part of the country. One is Fort Keogh, which is very important to developing better range practices and grasses that are endemic to that part of the country.

I would like to ask you what you know about Fort Keogh. I mention it because there is some talk that the administration would like to close Fort Keogh. I am encouraging you not to close Fort Keogh, and also I encourage the Department to use practices that involve not only pesticides, but other biological practices to help develop more nutritious sturdy grass. Can you tell me what you know about it, and the degree to which the Department is going to continue not only that particular research station but also developing biological research?

Dr. HESS. Senator Baucus, I remember you raised this question during the confirmation hearing. I have not had a chance to inquire from Agricultural Research Service about the station, nor have I had a chance to visit there.

There are no plans to close either the Fort Keogh station or other stations in Montana. There had been a suggestion by the Users Advisory Committee that we do look into stations that are around the United States that have small staffs, and they questioned whether they could be efficient or not. That is their recommendation. That is not necessarily a decision of the Department.

Senator BAUCUS. So the Department plans to keep Fort Keogh alive and well?

Dr. HESS. Based on the information that I have, yes.

Senator BAUCUS. Good. Let me turn now to Sidney, and particularly the importance of safflower research. As you well know, safflower as a substitute for some other crops, say for example wheat, is ecologically sound. It is a very nutritional crop and it is a crop that can be grown in areas that have been, if not devastated, at least harmed by saline seep. I am wondering if you could shed some light on the degree to which you believe it is important for us as a country to participate in more safflower research as an alternative crop?

Dr. HESS. I certainly can support that. I keep referring back to my experience at Davis, where we had quite a large oilseed breeding project, and in fact we were working in safflower and genetically modifying the quality of the oil to meet even a wider range of nutrient requirements and other uses. Let me just say that I am very supportive, one, of looking at new crop development, modifying existing crops for other uses in some cases—nonfeed, nonfood uses—and safflower is certainly one of those crops which deserves attention and investment both in research and the distribution of the research information to growers.

Senator BAUCUS. So you support safflower?

Dr. HESS. I do support safflower, yes.

Senator BAUCUS. OK. One final point is oats. As you know, oats are also very nutritionally sound. Oats are in vogue today, you know, oat muffins and——

Dr. HESS. Absolutely, yes.

Senator BAUCUS. What about allowing oats to be used on set-aside, let farmers grow it and not lose their base?

Dr. HESS. Senator Baucus, that is a little out of my spectrum of responsibility.

Senator BAUCUS. A little out of your area, I know that.

Dr. HESS. Certainly I can carry your interest back to the Department and raise that as an issue, but let me ask, what is it you are——

Senator BAUCUS. Well, essentially encouraging the Secretary to exercise his authority to allow oats to be grown as a set-aside crop, or maybe even CRP. Right now no crops, no program crops, are allowed under CRP.

Senator FOWLER. How are your cherries doing? [Laughter.]

Senator BAUCUS. Well, Mr. Chairman, peaches and cherries are going to be doing a lot better.

Dr. **Hess**. I guess the only thing that I could respond to is, I am sure there are lots of commodities that would like to have the opportunity to be grown on set-aside land, and I would imagine there would be some resistance to granting it to one and not to others, so that——

Senator **Baucus**. I doubt that peaches would do very well on set-aside land, or cherries for that matter, but oats is a little bit different. [Laughter.]

Anyway, I would encourage you to look into it.

Thank you, Mr. Chairman.

Senator **Fowler**. Thank you.

Senator Bond, any questions? We have to let the Secretary go at 10, but we will give you some time.

Senator **Bond**. I was going to present a detailed description of all the wonderful crops grown in Missouri, since we are plugging all our crops, but I will submit those for the record. [Laughter.]

Senator **Fowler**. Those have been submitted in the record so many times.

Senator **Bond**. We will pass on that. I know that time is limited, Dr. Hess, but there are a lot of interesting things that you have discussed.

In your testimony you talked about some of the tremendous improvements, and I think all of us who are interested in agriculture are delighted with that. One of the things that I have heard from many of my farmers in Missouri, as we have toured the State asking about what kind of recommendations they would make for changes in the 1990 farm bill, focused on greater flexibility.

While they initially spoke of greater flexibility as a means of getting a better price and responding to market conditions, I was interested in the implications for crop rotation. Can you tell us a little bit about how you see crop rotation being an important conservation measure?

Dr. **Hess**. Part of it, of course, is if you can use leguminous crops in the rotation, they can provide a nitrogen source for future crops, so that is a very beneficial aspect. There are also crops that can improve the organic level in the soil, which then helps the moisture retention and nutrient retention so that you reduce the amount of nutrients that are leached into the ground water.

Of course, there has been work over the years, since the biotechnology has been introduced, to try to expand the range of crops that fix nitrogen. That has turned out to be more of a challenge than investigators originally thought it was.

Senator **Bond**. What are they finding that works?

Dr. **Hess**. Well, so far they are finding what works is looking at organisms that may not necessarily have nodules on plants but others that live in association with the root system. This actually is an area that has been underresearched, that is, the plant/root/soil interactions and the microorganisms that live on the sources of the roots, some of which can be very effective in helping the plants mine nutrients from the soil so that they are more efficient, and therefore you can apply less materials. There are examples in forest species of what are called microrhizae, which are organisms that do a tremendous job of this, and we are finding that there are other organisms that are beneficial.

Similarly, there are some organisms that play a role, in living in this environment of the soil and the root, of giving a plant protection, actually sort of biological control at the root level, and we are looking at ways of identifying those insects and then inoculating the seed so that those beneficial microorganisms are present in the root system to reduce pathogen attack of the roots and therefore reduce our dependency upon chemical control.

So those are all examples, some of which go beyond the rotation area but since we were talking about rotation, that reminded me of it.

Senator BOND. In what crops? Have they been applied on program crops or——

Dr. HESS. The ones that I am familiar with are primarily horticultural crops at this time.

Senator BOND. What is happening in conservation tillage? Are new things being developed in this area? What is the status on that? Some of our farmers are a little reluctant to get into it. What do they need to know?

Dr. HESS. Well, part of that of course is, we do have some challenges in terms of weed management, pest management. When you leave crop residues on the soil, they often harbor other insects, so we have to look at mechanisms by which we can mitigate the down side of the limited tillage techniques, so I think that is part of it.

Part of it also, I think, is one of education and adaption to change. I know, having grown up in a farm environment, that looking at nice clean soils, weed-free, looks——

Senator BOND. Totally cultivated.

Dr. HESS. Yes. It makes you feel very good.

Senator BOND. Unless the rows are running up and down the hillside.

Dr. HESS. Well, then it can look very bad, yes. Having debris left on the surface of the soil sometimes may seem not right. Well, in fact it is right in terms of actual productivity and certainly in soil and moisture conservation.

Senator BOND. How effective is the machinery that is being developed for removing pests? Can this really do the job? Is the energy consumed by running machinery, running a field vacuum, a significant concern?

Dr. HESS. Well, it looks like, after a couple of years of experience using the "bug vac" in California, in terms of insect reduction on strawberries and lettuce, that it does seem to work. I think all the homework is not in.

In terms of costs, with those high-value horticultural crops you probably can do it because the yields of strawberries are high and the value of the crop in the market is high, and so the return per acre can justify the investment. When you get into more agronomic crops, then the return per acre is such that you probably could not make that investment for a "bug vac."

Senator BOND. Are those machines available in the Washington area, if I wanted to rent one for my backyard garden, or am I going to have to wait a while before they are commercially available?

Dr. HESS. Oh, they are commercially available in Salinas, California. I don't know what the cost is, but——

Senator BOND. Thank you.

Thank you, Mr. Chairman.

Senator **Fowler**. Thank you, Senator Bond.

One last question, Dr. Hess. Back to water quality, before you go. In your testimony you stated that we need a better data base for our water quality. As you know, Senator Lugar and I have offered bills that encourage a well testing program for drinking water as a first step to developing this data base. Do you support that concept?

Dr. **Hess**. Yes, I think it is an important approach. I guess the Environmental Protection Agency is already doing at least a partial testing, and I assume that your legislation would make that uniform across the United States.

Senator **Fowler**. I want to work with you on what would be the best way to do it, but I appreciate your encouragement.

Dr. **Hess**. Part of our proposed water initiative is to develop methodologies which would reduce the cost of testing well water for the presence of pesticides.

Senator **Fowler**. Yes. Well, as you know, and you know far more than I do, again, most farmers who are suspicious about their water simply have not tested because the costs presently are so high to simply have your water tested.

Dr. **Hess**. Right.

Senator **Fowler**. We will work together. Thank you very much for your testimony this morning.

Dr. **Hess**. Thank you.

[The prepared statement of Dr. Hess follows:]

Statement By Charles E. Hess, Assistant Secretary
For Science and Education
United States Department of Agriculture
Before The Subcommittee on Conservation
And Forestry of The Committee on
Agriculture, Nutrition and Forestry
Of The United States Senate
June 22, 1989

Mr. Chairman and Members of the Subcommittee, I am pleased to appear here today to discuss agricultural production and conservation methods of the present and the future. The Subcommittee has given me a very challenging assignment.

Agriculture in the United States has as many aspects as there are people practicing it. There are full-time farmers and those who engage in farming part-time. There are corporate, family, and individually-owned farms and ranches. There are farms which are capital intensive and those which are labor intensive. There are farmers who subscribe to conventional technologies and those who hold to more organic methodologies of agriculture. And between each extreme of whatever scale you wish to choose, there are farmers and ranchers of all persuasions.

It is within this context that the United States Department of Agriculture (USDA) operates to provide the agricultural producer with the information, techniques and technology to successfully complete the job of agriculture as he or she sees it. Over the years, USDA, through its research and action agencies, has provided technology, education and other assistance to producers and to state and local governments to address production, market, resource, environmental, and export needs as they have been identified.

Agricultural systems today are a fusion of production and conservation practices. In the case of what has come to be called "conventional agriculture", marked technological advances have been made in equipment, germ plasm, fertilizer formulations, pesticides, irrigation techniques, and market development. There has been at the same time, a growing recognition of the need to conserve soil, water and related resources to sustain food and fiber production and enhance the environment. Over the period since World War II, conservation technology has been developed in conjunction with advances in production technology.

Today, the technologies of conservation and production are applied to the land in the form of systems which manage resources for both purposes. These systems are composed of vegetative, structural, and management practices. Conservation tillage and filter strips are examples of vegetative practices. Some of the structural practices used are terraces (gradient, tile-outlet, contour), water and sediment control basins, and diversions. Management practices include nutrient and pesticide management. Management practices are usually defined as the direct exercise of decisionmaking in the manipulation of a production or conservation input.

The conventional agriculture of today is not the conventional agriculture of even 5 years ago. Technology and science have moved forward and created new opportunities and new awarenesses. For example, resource management systems of the past did not always address environmental concerns such as water quality. Some of the reasons for not doing so were a lack of knowledge of local water quality concerns and a lack of planning methods capable of capturing water quality benefits. Our understanding of pesticide and fertilizer movements in soil is now much better than it was in the past, and the public concern for food safety and product market appeal as well as other product aspects has increased.

Conventional agriculture of the past generally held that fields should be tilled and left with all organic residues plowed under. The rise of conservation tillage practices is testimony to the appreciation by the producer of the multiple benefits which can be derived from new technology. Benefits of conservation tillage can be expressed in terms of reduced fuel costs and improved soil moisture retention as well as better soil conservation.

Great strides have been made in recent years in the development of pesticides which are less harmful to the environment. There has also been significant improvement in the technology and practice of Integrated Pest Management. Agricultural waste management has been improved by means of improved storage and handling facilities and in the technologies required to reclaim and reuse this resource, such as biogas production and composting technologies.

A Look to the Future

Several movements within agriculture and society have great promise for the future of agriculture. The ever evolving process called conventional agriculture is still doing just that...evolving. Increased environmental awareness, concerns for food safety, water quality, our Nation's wetlands, and the profitability in agriculture itself, and the increasing desire of citizens to engage in some form of agricultural pursuit are "the yeasts which are leavening the loaf."

What are we likely to see as the result of this activity? Probably the most obvious differences will be in the appearance of the land and the machines which will be used on it. If the past is prologue to the future, then there will be increasing use of some form of conservation tillage. More crops will be grown under conditions of high crop residue than are being grown now. Cotton, for instance, will be grown in residues from the preceding crop. Mulch tillage and slot tillage of various sorts will give the landscape a less disturbed look. Likewise, our machinery will be of the type which is now being tested in field laboratories. Planters will be able to sense micro-differences in soil clay and organic matter content and will be able to place fertilizer in proper amounts and depths within the soil to optimize yield. There will be more machinery which will be used to remove pest infestations without use of chemical formulations; field scale vacuums for instance.

Whole field composting (a refinement of residue use) will become an acceptable practice by which organic material can be incorporated into the soil, and plant nutrients recycled. Certain genetic breakthroughs could radically change agricultural systems, among these are non-leguminous crops with the ability to fix atmospheric nitrogen and annual crops which are made perennial in growth habit.

Our knowledge of the soil and agriculture has shown us that certain conventional methodologies are timeless. Among the conservation practices which will continue to be needed in the future are crop rotations, contour cultivation, strip cropping, and their various combinations. The basic physics of the land and the basic biology of our crops will sustain the need for these practices.

Management practices are dependent upon knowledge. However, before there can be knowledge, there must be a need to know or an appreciation of the need to know. Producer education in the ways in which nutrients and pesticides move in soil, how soil moisture interacts with them, and how they can be managed within the context of an agricultural system will grow in importance. This knowledge will create better management decisions.

Current work in the area of low-input, sustainable agricultural (LISA) systems has verified the fact that diversified systems do have greater resilience to the vagaries of nature and market. Those "conventional" conservation practices mentioned about (crop rotations, contour farming, strip cropping) are basic to any LISA system. Of equal importance is effective and efficient nutrient management. What is likely to happen is the evolution of social/business institutions such as "nutrient cooperatives". Just as cooperatives now exist to provide market leverage to the benefit of members,

members of such a nutrient cooperative would cooperate to the production advantage of its members. Crop producers practicing crop rotation would be able to supply livestock growers in the cooperative with forage in return for animal waste and bedding which would be returned to the land. In other aspects of their enterprises cooperative members would be independent. This last example is lifted up, not as an example of some utopian ideal; it is, however, offered here as a possible alternative arrangement by which agricultural production of the future can work through the ingenuity of producers and with support from society as a whole.

There are some obstacles to the adoption of the new, environmentally safe conservation and production methods. I will mention a few. One is the lack of information about the extent of the problems arising from present methods. Solid research and monitoring data on the nature and extent of environmental problems arising from agricultural production is very scarce, particularly effects of production agriculture on ground water quality. If you examine the available data, you will find that many of the reports talk about "some" samples in "some" states indicating that a problem exists. We simply don't have a reliable data base to help us understand the nature and extent of the problem from a national perspective.

Coupled with this lack of basic information about the extent of the problem is a shortage of research information which addresses technology needed to respond to problems where they do exist. We need to develop economically viable production practices which avoid or minimize pollution from agriculture. This is not an easy or short-term task.

There is also a lack of information among producers about known means to reduce risks to the environment from agricultural production. Education and technical assistance programs need to be enhanced to help make sure that the best available technology, which is economically feasible, is adopted. This is a key element in USDA's approach to such environmental concerns as water quality.

There are also institutional obstacles to the adoption of environmentally safe production methods. An example is farm program base acreage requirements which reduce producer flexibility and encourage monoculture while limiting crop rotations. As mentioned earlier, crop rotations can have beneficial environmental effects by reducing the need for pesticides and off farm sources of nutrients.

In addition, there is a need to coordinate better the work and programs of the many federal, state and local organizations and the private sector involved in researching and promoting environmentally safe production practices. We all need to work together to develop the best scientific information, to translate it into practices that are economically feasible, and to provide it to producers.

Finally, allow me to discuss briefly an example of how we are overcoming some of the major barriers facing the implementation of environmentally protective production practices, using existing legislation and authorities. This example concerns water quality.

First some background. In his 1990 budget proposal presented to the Congress on February 9, 1989, President Bush included an initiative on enhancing water quality. The President's initiative defines a vigorous effort to protect ground and surface water from potential contamination by agricultural chemicals and wastes, especially pesticides and nutrients. The initiative focuses the combined expertise of agencies of four federal departments to promote use of environmentally and economically sustainable farm production practices and to develop safer chemical and biological pest controls.

The Department and cooperating state institutions understand that the main emphasis for the budget increase is on reducing ground water contamination by agricultural chemicals. Current programs addressing degradation of water quality as a result of agricultural practices are to continue.

In his statement of principles and policies, the President makes it clear that farmers are ultimately responsible for avoiding contamination of water resulting from the management practices they apply to the landscape. He also stated that the role of USDA is to conduct research and provide education and technical assistance to help producers fulfill their responsibilities and obligations by providing and demonstrating "...farming practices that avoid water quality degradation...", and that are economically viable.

The USDA and the cooperating state institutions accept the challenge and the responsibilities for their part in the President's initiative. A multi-agency, multidisciplinary plan has been developed with the following goals: 1) to assess the seriousness and extent of agriculture's impact on water quality, with an emphasis on ground water, and 2) to develop and promote the voluntary adoption of new and improved agricultural management systems that are cost effective and enhance water quality by demonstrating their contributions to farm profitability and competitiveness.

These goals will be addressed and coordinated through integrated efforts by USDA and other federal and state agencies. The work will be instrumental in removing obstacles to the development and adoption of environmentally safe practices. It will focus on three major program areas:

- Research and Development - Initiate and expand research to improve our understanding of water contaminant sources and processes. Prove new and improved agricultural and forestry management practices that reduce the chances of water resource degradation. Determine socioeconomic impacts of current and new management practices on the farm, community, and regional basis, and measure the cost-effectiveness of these new practices.

- Education and Technical Assistance - Enhance water quality by developing and demonstrating new and improved production management practices from already available research results and from new techniques developed under the Research and Development program. Accelerate activities to encourage adoption of these practices to reduce or prevent contamination where agricultural nonpoint source pollution of ground water or surface water has been identified as a current or potential concern.

- Database Development - Enhance collection and distribution of data on the use of agricultural chemicals and related cropping practices and soil characteristics. Improve data management activities to assist decision makers in addressing issues related to water resources, especially the effects of agricultural chemical use on water quality.

Actions taken under this initiative will lead to a substantial reduction in the contamination of U.S. water resources by agricultural chemicals and wastes, if the programs and practices developed and demonstrated by the USDA and its federal and state partners are accompanied by national agricultural policies that allow and encourage their adoption. Ongoing research, education and technical assistance programs will continue to provide information in support of voluntary adoption of improved, cost-effective production practices to protect and enhance the quality of the Nation's water resources.

We believe that our water quality initiative will demonstrate that USDA and its partners in the private sector and federal, state and local government can develop and implement cost effective technologies to sustain a profitable and environmentally safe agriculture. We believe it can be used as a model to address other emerging environmental issues, such as global climate change.

I thank you and the Members of the Subcommittee for the opportunity to appear here today, I welcome the opportunity to respond to your questions.

Senator **Fowler**. Our first panel is Dr. Charles Laughlin, associate director of the Georgia Agricultural Experiment Stations; Ms. Margaret Krome, director of Sustainable Agriculture in Madison, Wisconsin; Mr. Bob Darst, vice president of the Phosphate Institute in Atlanta; and Ms. Teresa Maurer, coprogram director and research coordinator, the Kerr Center in Oklahoma. Welcome, ladies and gentlemen. Glad to have you.

Ladies and gentlemen, as you know, when you were invited, because of the number of witnesses that wanted to testify and the quality of those witnesses, we will put your entire statements in the record but we have to be pretty close now on calling time after 5 minutes, in order to have some time hopefully for a few questions. When the red light goes on, please try to end up in the next 30 seconds, a minute or so, if you will begin your summary. Thank you for understanding the crazy way we have to do business here.

Dr. Laughlin from Georgia, welcome.

STATEMENT OF CHARLES W. LAUGHLIN, ASSOCIATE DIRECTOR, GEORGIA AGRICULTURAL EXPERIMENT STATIONS, ATHENS, GA

Dr. **Laughlin**. Thank you very much.

You made a statement on how the question of low-input sustainable agriculture was being received back home, and I think I can understand why there are problems with it.

LISA

Much effort is spent in discussing "what is Low-Input Sustainable Agriculture (LISA)?" in many agendas. Some think it means small farms versus large farms. Some think it means traditional versus alternative crops and animals. Others think it means moving toward a new kind of farming versus sliding back into the farming of generations ago. I think the concepts of sustainable agriculture encompass a concern not only for what we grow, but how we grow it and what the consequences of these decisions are on the future. When we talk about low-input sustainable agriculture, we are really talking about alternative strategies, so producers can substitute management skills and knowledge of biological systems for purchased inputs. I think it is important to remember there is not just one path but there are many paths to get there. It is not so important which path is selected, but rather that the path lead to the desired goal, which is a healthy agriculture that can be passed on to future generations.

ONE NEEDS TO ASK WHY AMERICAN AGRICULTURE HAS DEVELOPED SUCH A DEPENDENCY ON INORGANIC FERTILIZERS AND PESTICIDES

I think one needs to take a step back and ask, how is it that American agriculture has developed its dependency upon these purchased inputs—inorganic fertilizers and pesticides? These purchased inputs: one, reduced much of the drudgery associated with farming; second, it has reduced the risk associated with crop and animal production; third, it has permitted American agriculture a way to meet an increased world demand for food in the world economy; four, satisfied the public's demand for blemish free produce; five it has also supported a public policy which promotes cheap food; and six it has also responded to a public policy which has viewed natural and agricultural resources as infinitely renewable, and which did not consider the environmental issues associated with agriculture.

FARMERS IN THE SOUTHERN U.S. HAVE THE MOST COMPLEX AGRO-ECOSYSTEMS FOR CROP PRODUCTION FOUND IN NORTH AMERICA

The Senator from Montana mentioned regionalization as it relates to agricultural problems. I am going to speak specifically about the southern part of the United States, where farmers probably have the most complex agro-ecosystem for crop production found in North America. Due to the inherent low fertility of the soils and a climate which favors optimal growth of pest populations, southern farmers face production challenges not found in the rest of the country. Unfortunately, the component information, let alone the interactions—and by component information I am talking about crop varieties, rotational practices, tillage systems, soil fertility, productivity, water conservation, livestock management, in addition to the interactions which are available—this is not well understood, if one is going to be looking at these systems and trying to change these systems in the near future.

Transitions from present production systems to lower input systems will require change by evolution rather than revolution, if the changes are to be truly sustainable. The set of strategies for a given production unit are very site-specific, and change at a given site over time, due to the dynamics of "Mother Nature."

One of my responsibilities with the University of Georgia is the coordination of the Southern Regional Low-Input Sustainable Agriculture Research and Education Program. As you are well aware, this was authorized in the 1985 farm bill and was funded in 1988.

I think an important part of this legislation is that it has brought together farmers, conservationists, scientists, and educators from both the public and private sector to work together to develop and implement alternative strategies for profitable, environmentally sustainable agricultural production system. The LISA program, in my view, will be a major contributor to establishing a basis so that agriculture can move into this more sustainable realm.

The Southern Regional LISA program reviewed 254 proposals for the region over the last 2 years. Due to the limited resources, only 18 of these projects were funded, but it should be noted that the commitment by the State Agricultural Experiment Stations of non-Federal dollars was about double those that were provided through the Federal source, so there is a very significant commitment by the State Agricultural Experiment Stations.

CONCLUSION

The challenges facing American agriculture today are very, very significant. It is in transition. There are new sets of criteria which are being used to evaluate agriculture and what it is contributing to American society. As we move forward, decisions need to be made based upon good science so we understand why we are doing it, what we are doing, and what are the ramifications of the decision.

Thank you, Senator.

[The prepared statement of Dr. Laughlin follows:]

STATEMENT OF CHARLES W. LAUGHLIN, ASSOCIATE DIRECTOR, THE GEORGIA AGRICULTURAL EXPERIMENT STATIONS AND COORDINATOR OF THE SOUTHERN REGIONAL LOW-INPUT SUSTAINABLE AGRICULTURE RESEARCH AND EDUCATION PROGRAM

Mr. Chairman, members of the Subcommittee on Conservation and Forestry, I appreciate this opportunity to discuss issues relating to the proposed legislation, "Farm Conservation and Water Protection Act of 1989."

Much effort is spent in discussing "what is Low Input Sustainable Agriculture (LISA)?" Some think it means small farm vs. large farm; traditional vs. alternative crops and animals; or moving toward a new kind of farming vs. sliding back into farming of generations long gone. The concept of sustainable agriculture encompasses a concern for not only what we grow, but how we grow it and what the consequences of these decisions are on the future. When we talk about low input sustainable agriculture, we're talking about alternative strategies so producers can substitute management skills and knowledge of biological systems for purchased inputs. There are many paths to a sustainable agriculture. It's not so important which path is selected, but rather that the path lead to the desired goal -- a healthy agriculture that can be passed on to future generations. Research is the key to identifying alternative paths.

There are many positive aspects of the proposed legislation. The goals of our nation should be to protect the environment, conserve agricultural resources, guard the health of farmers and consumers, and provide for a profitable agricultural sector. However, many paths, not just one, are available to reach these goals. Understanding of alternatives through research and the implementation of these alternatives through educational programs have the potential for a more sustainable agriculture than legislative mandates.

One needs to ask why American agriculture has developed such a dependency on inorganic fertilizers and pesticides. These purchased inputs 1) reduced much of the drudgery associated with farming; 2) reduced risk associated with crop and animal production; 3) permitted American agriculture a way to meet an increased world demand for food; 4) satisfied the public's demand for blemish free produce; 5) supported the public policy promoting "cheap food"; and 6) responded to a public policy, which viewed natural and agricultural resources as infinitely renewable and which did not consider the environmental issues associated with agriculture.

Farmers in the southern U.S. have the most complex agro-ecosystems for crop production found in North America. Due to the inherent low fertility of the soils and a climate that favors optimal growth of pest populations, southern farmers face production challenges not found in the rest of the country. Unfortunately, component information, let alone the interactions between crops and crop plant varieties, rotation practices, tillage systems, nutrient management, soil fertility and productivity, pest management, water conservation, and livestock management, is not available to develop meaningful technical guides.

Even with all the information for a given system, a meaningful national LISA technical guide is improbable due to local factors and constraints. Transitions from present production to lower input systems will require change by evolution rather than revolution if the changes are to be truly sustainable. The set of strategies for a given production unit is very site specific and changes at a given site over time due to the dynamics of "Mother Nature." Assuming meaningful guides are developed, any realistic farm management plan must provide the flexibility to be adjusted on a regular basis within the concept of LISA to permit adaptation to changing economic and environmental conditions. The results of rigid 5-year agricultural production plans are well documented by the history of USSR agriculture. Research, not legislation, is needed to provide the basis for these technical guides.

The Low Input Sustainable Agriculture Research and Education Program was authorized in the 1985 Farm Bill but was not funded until 1988. This legislation brought together farmers, conservationists, scientists, and educators, from both the public and private sector, working together to develop and implement alternative strategies for profitable, environmentally sustainable agricultural production systems. The LISA program will be a major contribution to the information contained in the technical guides. Unfortunately, this program is significantly under funded. The Southern Regional LISA program reviewed 254 proposals over the last two years. Due to limited resources, only 18 of the projects were funded.

The Agricultural Stabilization and Conservation Service (ASCS), Soil Conservation Service (SCS), and Extension Service are designated in the proposed legislation to administer the major components of the Bill. The proposed legislation, which states "The Soil Conservation Service and Extension Service shall be responsible for certifying compliance by individual producers...", changes the role of the Extension Service from educational to regulatory. Should Extension be placed in a regulatory role, their legitimate educational role will be jeopardized. Also, the conducting of research by the Extension Service via the Farm Conservation Service further expands its role from education into research. Over the past century, Congress has been clear in its intent for public agricultural research to be the responsibility of the research agencies of USDA (Cooperative State Research Service and the Agricultural Research Service). The Cooperative State Research Service of USDA coordinates the federal research programs of the State Agricultural Experiment Stations and interfaces with other federal agencies. There is a system already in place to conduct the appropriate research.

Mr. Chairman, this proposed legislation has the potential to be a very constructive instrument if it concentrates on directing the necessary resources to existing agencies (State Agricultural Experiment Stations, Agricultural Research Service/USDA, state Cooperative Extension Services, and Soil Conservation Service) to accelerate the development of scientifically, economically, and more environmentally sound agricultural systems for this nation. The goals of this legislation can better be served by supporting research and education than by mandating regulatory constraints.

I'll try to answer any questions you or other members of the Subcommittee may have.

Senator FOWLER. Thank you, Dr. Laughlin. Very fine.

Ms. Krome, is that correct? Good. We welcome Ms. Margaret Krome, the director of the Sustainable Agricultural Program of the Wisconsin Rural Development Center, in Black Earth, Wisconsin.

STATEMENT OF MARGARET KROME, DIRECTOR, SUSTAINABLE AGRICULTURE PROGRAM, WISCONSIN RURAL DEVELOPMENT CENTER, MADISON, WI, REPRESENTING THE WISCONSIN RURAL DEVELOPMENT CENTER, BLACK EARTH, WI

Ms. KROME. Thank you very much, Mr. Chairman, and good morning, and good morning to Senator Bond, as well.

INTRODUCTION

I am the director of the Sustainable Agriculture Program with the Wisconsin Rural Development Center in Black Earth, Wisconsin. We are a private, nonprofit group. Our mission is essentially to work with farmers to help pull together strong, healthy rural communities, to develop ways of developing stewardship of the land, and we are interested in helping farmers develop the information that they need on sustainable agriculture. That is, in fact, how we became involved in this.

I am also here today representing the Sustainable Agriculture Coalition. The coalition is a group of Midwest-based, private, nonprofit organizations who have been working together to do on-farm research and demonstration and to develop and promote policies which support sustainable agriculture at the State and national level.

Very broadly, I think that our perspective has a great deal in common with many of the other people who have spoken today.

GOALS OF SUSTAINABLE AGRICULTURE

Many people across the country care increasingly about ground water and about reducing the use of agricultural chemicals. We are delighted to see this kind of increased concern in water quality, and our concerns are very similar. However, the goals of our effort go considerably beyond that. In our view, sustainable agriculture, perhaps we fall into the group that Dr. Laughlin referred to as some of the actors who feel quite strongly that sustainable agriculture isn't synonymous with water quality. That is one of the very important goals of sustainable agriculture, but sustainable agriculture should be as concerned with viable rural communities—economically healthy, culturally and socially healthy rural communities. We are also concerned about protecting human health, and we want to protect resources, natural resources, and encourage stewardship of them. So with those goals, we are interested in finding policies to support them.

S. 970

I will start off by saying that we are delighted to see S. 970 introduced. We are enthusiastic about the bill and many of its provisions, and are grateful to you, Mr. Chairman, for your leadership in this area.

POLICY AREA OF RESEARCH AND INFORMATION DELIVERY

As we look at the policy area of research and information delivery, I think that it is fair to say without belaboring the point that the current system has not fostered the goals that I just laid out. At times it has met some of them, but it has certainly not met them all in a comprehensive way. I think that point is simply made clear by the fact that groups such as ours have farmers coming to us all the time. All across the country there are groups such as the Wisconsin Rural Development Center. In every State there are people who have come to us and said, "We need good information and we're not getting it." I think that in itself is as clear an indicator that we need to have some positive changes in the system as any that I need to make.

SOME RESEARCH AND INFORMATION DELIVERY IDEAS THAT WE HAVE

In terms of research, I would like to use the rest of my time to talk about some research and information delivery ideas that we have. They are elaborated in our written testimony.

THE ECOLOGICAL ASPECTS OF FARM MANAGEMENT

Generally, some of the topics that we would like to see addressed cover, as I talked about, some of the ecological aspects of farm management. I was delighted to hear Dr. Hess' example of the plant/root/soil relationships. I think that is a good example of some of the research that needs to be done.

We need research on low chemical, low purchased inputs, less capital-intensive, more management-intensive farming approaches. We need to have good research and information developed on low-investment family farm livestock production systems. We need to have sustainable methods of weed, insect, and disease control, and nutrition. We need socioeconomic research to help understand the impact of the technologies we develop, to help understand their implications for family labor, community development, and so forth.

We need policy research and, of course, we do think that IPM's, BMP's, and the good biotech that we have heard people referring to has a role, but it is clear that sustainable ag is more encompassing than that. I would like to have included in the record, if you would be agreeable, a list of some of the ideas that we have developed on a production-related sustainable agriculture research agenda [attachment 1], some of the specific suggestions we would make.

Senator FOWLER. They will be. Thank you.

Ms. KROME. Thank you very much.

IN TERMS OF STRUCTURE

In terms of structure, I was also delighted to hear Dr. Laughlin refer to the importance of having farmers and private nonprofit groups and others involved in a research project such as the LISA program. I think it is very important, and I too am a strong supporter of the LISA program.

It is very clear that the LISA program has been very badly underfunded. We need more funding in it. It is clear that the number of proposals, there were over 800 proposals in the last 2 years and only 82 have been funded. I am told by people involved in this process that we have about $16-plus million worth of really high quality proposals, and we have ended up with $3.9 million the first year and $4.45 million the second year. We clearly need more than that.

There are several other ways that the Federal Government can be very proactive in being involved. They are outlined in my testimony. I would be delighted to answer any questions on research or information delivery as well.

[The prepared statement and attachments 1 and 2 of Ms. Krome follow:]

TESTIMONY OF MARGARET KROME

OF THE WISCONSIN RURAL DEVELOPMENT CENTER

BLACK EARTH, WISCONSIN

ON ALTERNATIVE AGRICULTURE PRACTICES

BEFORE THE CONSERVATION AND FORESTRY SUBCOMMITTEE

OF THE

SENATE AGRICULTURE, NUTRITION AND FORESTRY COMMITTEE

JUNE 22, 1989

Mr. Chairman and members of the Subcommittee, I appreciate the opportunity to testify today regarding alternative agricultural practices and the research and information delivery systems needed to support them.

I am representing the views of the Wisconsin Rural Development Center, a private non-profit organization located in Black Earth, Wisconsin. Our mission is threefold: to promote an agricultural system based on small to medium-sized family farms; to foster economically, culturally and physically vigorous rural communities; and to encourage stewardship of rural natural resources. I am director of the Sustainable Agriculture Program at the Center, which has been active since late 1985 assisting farmers in obtaining reliable information on alternatives to chemical forms of weed control, insect control and soil nutrition.

We work closely with farmers and other rural citizens, and the views I will express today stem from much discussion with Wisconsin farmers regarding their information needs. They also arise from discussions within the Sustainable Agriculture Coalition. The Coalition is a group of midwest-based, private, non-profit organizations who work with farmers to conduct on-farm research and demonstrations and promote policy changes at state and national levels to support sustainable agriculture.

Many people today in Congress and around the nation are concerned about groundwater purity and seek to reduce widespread use of agricultural chemicals. These concerns are healthy, and we applaud them. However, the goals of sustainable agriculture go further and address broader issues. Sustainable agriculture supports economically, socially and culturally healthy rural communities. I understand that rural development is a topic much discussed here in Washington these days. In our view, the basis of a strong rural development policy is a strong sustainable agriculture policy. Another goal of sustainable agriculture is to protect human health - both that of farmers and farmworkers, and also of consumers. Sustainable agriculture also promotes natural resource protection and stewardship, including soils, air, and wildlife as well as groundwater.

Many recent studies have shown that a key obstacle to widespread adoption of sustainable agriculture is the lack of reliable information. It is our strongly held view that the current system of research and information dissemination has not fostered these goals. While it has, in some places, addressed some of them, it certainly has not done so in the comprehensive manner that farmers need. Indeed, it is unfortunate that to many farmers nationwide our public agricultural research system has become synonymous with high-production agriculture, based on high inputs of agricultural chemicals and capital, rather than with resource stewardship, profitability, and creative opportunity in agriculture.

We need positive changes in our research and information delivery system. I believe, if Wisconsin can serve as any example, that there is strong and wide-reaching political support for aggressive and creative approaches in developing a research and information delivery system that is responsive to the needs of sustainable agriculture. Below, I outline desirable topics, structure and actual policy proposals that can help get our national, public research system into the mainstream of farmers' concerns.

Research Topics

Production - What topics need to be addressed in a thoughtfully developed research program on sustainable agriculture? We need applied research on farming methods emphasizing low chemical use, low-purchased-inputs, and high management. Thus, we need to develop sustainable methods of soil and crop nutrition and weed, insect and disease control. We also need basic research in agroecology to help us understand interactions between different elements of the farming system. Research needs to work to provide a whole-farm analysis of farm agronomic, economic, biological and other dynamics.

I am attaching a list of research topics related to sustainable agricultural production that the Sustainable Agriculture Coalition and others have identified this past year. Perhaps it may be helpful in expanding on the research policy language in Senator Fowler's excellent bill, S.970, relating to sustainable agriculture.

Socio-Economics - Research should study socio-economic consequences of both "conventional" production systems and sustainable ones. Our public research institutions need to anticipate socio-economic impacts of the technologies they develop. Such analyses should not be restricted to profitability analyses, but should also look at questions such as family labor requirements, family relations, goals of the family farm, farm tenancy, implications for community development, and farm indebtedness.

Livestock - From a midwestern perspective, farmers particularly need research on low-investment family farm livestock production systems. Livestock is a valuable addition to a sustainable farm, as the crop mix needed to feed livestock is suitable for a balanced rotation of forages, small grains and feed grains. Also, of course, livestock manure serves a key role in the nutrient cycle on farms. However, many of our family farmers are going out of business, partly because of the concentration of the meat packing industry, and partly because of the capital-intensive nature of livestock raising. Many farmers feel they must invest in confinement facilities, extensive feed storage and so forth in order to be competitive. They need research on low-capital, high-management approaches.

Policy - Not only do we need to study technologies' impacts on our rural communities before investing extensive research dollars in their development. We also need to study creative policy alternatives to dig ourselves out of holes these technologies often create.

Diversification/New Uses - We support research aimed at developing new crops that favor a low-chemical, high-management farming system. We also encourage work on new uses for agricultural commodities, when those commodities are sustainable, low-chemical-demanding crops such as clovers, alfalfa, oats, rye, barley and other legumes and small grains. We encourage research to develop value-added strategies appropriate to small to medium-sized family farms or rural communities.

You may wonder where integrated pest management (IPM), best management practices (BMPs), and so-called "benign" biotechnology research fits into our sustainable agriculture research agenda. No doubt there is a role for these approaches. However, they have often sought to provide partial solutions aimed at enabling farmers to use chemical-intensive practices by mitigating their effects, rather than developing alternative practices. Thus, our agenda is more encompassing.

Research Program Structure

A meaningful sustainable agriculture research program must involve farmers in setting priorities and in actually conducting research. Likewise, it should involve private, non-profit organizations, many of which have worked extensively with farmers seeking information on sustainable agriculture and can be valuable research partners. For example, the USDA's Low Input Sustainable Agriculture (LISA) program offers a model of how a federal program can increase access to the research system and in the process create valuable networks within the agricultural community. Other research programs should follow LISA's excellent example.

Researchers should also explicitly solicit views on information needs from farmers, both through formal mechanisms such as "listening sessions" and through the extension system, which should serve as a conduit from farmers back into the research system.

A research program should stress interdisciplinary work, permeating the entire research system, not only an isolated program within it. There are many institutional obstacles to sustainable agriculture research, such as the lack of prestige, lack of assured long-term funding, difficulties in communicating and coordinating across disciplines, publishing, obtaining tenure, and others. Sustainable agriculture research programs need high-profile administration, and should seek through a variety of formal and informal means to remove institutional obstacles to researchers' involvement in sustainable agriculture work.

How Can the Federal Government Help Get Us There?

Congress and federal agencies have several policy possibilities to assure that needed research is actually conducted and in the most constructive manner possible.

Fund Special Sustainable Agriculture Programs -

First, simply, Congress can and should fund research that addresses topics such as those outlined above. The best example of this approach is the USDA's LISA program. This program has already proved its value and has great potential to accomplish much more. It is unfortunate that to date it has been funded at such small and token levels. We appreciate the Senate Agriculture Committee's support in the past for LISA funding and urge you to again aggressively seek to assure substantially increased funding. Across the nation, there are public researchers interested in studying sustainable agriculture topics. They know these are crucial issues in the minds of farmers they serve, yet they cannot get funding to pursue them. It is significant that the LISA program has been flooded with proposals to pursue this work. Clearly, it has touched a nerve with researchers, eager to pursue this line of work and with farmers, eager for the results.

Congress should initiate other competitive research grant programs on aspects of sustainable agriculture. For example, it might fund specific conservation research programs, new sustainable crop development programs, or agroecology programs. Care needs to be taken, of course, that these programs not substitute for the more comprehensive LISA approach and that the research address fundamental goals laid out in the beginning of this testimony. Any competitive grants programs need to aggressively solicit proposals from the 1890 as well as other land grant institutions.

Congress should also establish federal competitive one-time grants to organize and institutionalize sustainable agriculture programs on land grant campuses. These grants, which should be matching grants, might be viewed as analogous to the "capacity building grants" that some groups have proposed with regard to the topic of biotechnology. In the sustainable agriculture field these are particularly important, because there are so many institutional obstacles to overcome in establishing a strong research program. Competitive research dollars alone will merely foster a piecemeal approach to research unless there is administrative capacity to coordinate and develop such efforts.

Contingencies on Federal Monies - A second way the federal government can help build a strong sustainable agriculture research program is to place contingencies on federal research funding to land grant institutions. For example, Hatch Act funding could be dependent on campus commitments to meet any or all of several requirements: to allocate a significant portion of discretionary dollars toward sustainable agriculture topics; to conduct interdisciplinary research; to develop an administration to coordinate such research efforts; or similar contingencies.

Set Clear Research Criteria - Third, the Sustainable Agriculture Coalition urges Congress to develop explicit sustainable agriculture goals covering all federally funded research. These goals become basic criteria for evaluating all federally funded research. They apply to USDA-funded research and competitive grants from other agencies, including agriculturally related research funded by the National Science Foundation, National Institute of Health or other agencies.

One example where such an approach would be sound is the Water Quality Initiative proposed in the current 1990 budget. As valuable as this proposal is in certain respects, some of the research proposed frankly leaves much to be desired. It fails to provide a meaningful role for farmers and uses examples of research on "alternative" agricultural practices that fall far short of what a balanced sustainable agriculture program should address. The proposal focuses on reducing amounts of chemicals in groundwater, not by offering farmers practical low-chemical or no-chemical management alternatives, but by developing technologies that facilitate breakdown of chemicals, modify application technologies, such as chemigation or fertigation, and similar palliatives. This initiative would profit from an evaluation based on its effectiveness in meeting sustainable agricultural criteria.

Special Incentives - Fourth, Congress and the USDA could generate considerable interest among campuses by developing special programs to reward superior sustainable agriculture programs. Such a one-time funding award could take the form of a bonus to formula funds, and criteria for awarding it might be based on sustainable agriculture criteria discussed above.

Information Delivery

Topics Covered

Information that farmers need provided to them is essentially similar to research topics previously discussed. However, it should cover practical, hands-on information and aim to cover near-term information needs, based on currently available information. More important, topics covered need to respond to farmers' own assessment of information they need. In addition to research sources, information should come from farmers' extensive knowledge based on trial and error. It should draw on both national and international sources and on current research as well as that from the past - even decades ago - if it proves valuable today.

Structure

Farmer involvement needs to be explicitly structured into these efforts. This is crucial both to clarify what information farmers need, and because farmers themselves hold an impressive store of information. Indeed, recent research findings show that Wisconsin farmers identify other farmers as the most reliable source of information on ways to reduce their chemicals. This is likely true of other aspects of sustainable agriculture also. Examples of effective farmer involvement include structuring farmer-to-farmer networks, funding on-farm research and demonstrations, and developing a corps of farmer-trainers charged with sharing their knowledge and experiences within the farm community. Farmers should be encouraged to participate in projects jointly with their extension agents, other agencies' staff, and sustainable agriculture organizations.

At a state level, it is important that Extension have sustainable agriculture specialists to provide technical assistance to field staff, other agency staff and farmers in particular areas. In addition, substate, regional specialists are needed to work proactively to assure that local field staff are able to deliver information on sustainable agriculture topics needed by farmers in the region.

At both national and local levels, efforts need to be coordinated between the Extension Service, the Soil Conservation Service, Agricultural Research Service and conservation agencies. This is essential to assure consistency among agencies, and efficiency in pooling resources.

Activities

In addition to funding farmer-involved programs such as described above, efforts should focus on other activities. We believe that training for extension, conservation, and education field staff is key to overcoming institutional sluggishness in this area. Field staff should provide individual technical assistance as well as facilitate public discussion. It is especially important to work proactively to assist farmers who, for whatever reason, generally do not seek assistance from Extension or other agencies. Many of these farmers are the most in need, and it is an agency responsibility to overcome barriers to successful communication with them.

Another important activity is to work with high school and vocational schools to develop instructional programs on sustainable agriculture. Like all of the outreach activities discussed, this requires developing materials appropriate to the purpose.

A crucial role for Extension is to solicit farmers' views of research priorities and be a formal conduit for them back to the research system. This feedback function is essential to providing the research system the basis for developing new research initiatives. It also provides important measures of the relevance of an institution's research program.

How Can the Federal Government Help Get Us There?

Senator Fowler's bill, S.970 provides an excellent start in recognizing the need for a strong Extension program on sustainable agriculture. It establishes a solid basis for specific policy initiatives. The Sustainable Agriculture Coalition has developed a paper outlining some suggestions for such specific policy initiatives, which we hope may be useful to you in developing this section of the bill. I would like to submit this paper with my testimony into the record.

In brief, we propose to establish a national Sustainable Agriculture Extension Program. This program will oversee information delivery activities around the nation on sustainable agriculture. The program needs to address a comprehensive set of program initiatives, including conservation, water quality and the many other facets of sustainable agriculture. It would foster activities such as those described above.

Political Realities

Sustainable agriculture addresses issues whose time has come. Its support is broad and increasing. For example, even five years ago low-chemical farming practices were relatively unknown. Today, 76% of Iowa farmers polled recently by an Iowa State University researcher think that modern farming relies too heavily on chemical fertilizers and pesticides. Sixty nine percent of those polled indicated that increased use of low-input farming practices would help maintain natural resources.

In Wisconsin, concerns about groundwater and farm profitability are rapidly bringing more farmers to try sustainable practices. This spring, we have developed a sustainable agriculture proposal in the Wisconsin Legislature to develop a research and information delivery program within the University of Wisconsin - Madison called the Center for Integrated Agricultural Systems. The proposal, which we expect to pass both houses of the Legislature this week, has been supported by every major farm and environmental group in the state. In turn, the College of Agricultural and Life Sciences at UW-Madison has worked to assemble a credible program, involving in the process some who have been its most severe critics. These are some of the healthy signs that in Wisconsin our public agricultural research system is listening to changes in public sentiment, and is preparing to respond.

Such stories are increasingly common across the nation. Political actors of many stripes are recognizing that these issues are of enormous public interest. The time has come for the federal government to respond aggressively to the needs this interest represents. We look forward to participating in the development of strong, creative policies to assure that our public agricultural research and extension systems provide farmers with the information they need on methods of agricultural production that are environmentally sound, economically and socially viable and that serve the long-term best interests of rural communities and the American public.

Thank you for the opportunity to testify today.

[Attachments follow:]

Attachment #1

—Attachment 1

Production-Related Sustainable Agriculture Research Agenda

Many farmers around the country are attempting to reduce their chemical fertilizers, herbicides, insecticides and fungicides. These efforts are of public interest as, in addition to increasing farm profitability, they can help protect the environment, use fossil fuels more efficiently and foster healthy rural communities.

Land Grant and other public universities should conduct research to develop methods and technologies to help these farmers. Research should emphasize topics that won't otherwise be conducted by private, corporate researchers. It should be interdisciplinary, drawing on many academic fields, including agronomy, soil science, economics, rural sociology, engineering and others that pertain. Research should be conducted in cooperation with farmers and, as much as possible, on operating farms.

The following is a list of specific research topics that can help farmers as they reduce farm chemicals. It is illustrative and not comprehensive.

Weed Control

Researchers studying alternatives to chemical herbicides should study weed ecology - interactions of weeds with their environment - to learn how management practices can influence their growth and distribution.

* Mechanical weed control technologies
* Crop rotations
* Cover crops and companion cover crops
* Weed-soil relationships to learn how to manipulate soil tillage, fertility, etc., as weed control mechanisms
* Weed seed germination and viability and how management practices can affect (speed up and concentrate) germination
* Leaching from herbicide applications
* "Weed economic thresholds" instead of total elimination of weeds
* Allelopathy - plant exudates discouraging growth of other plants
* Breeding allelopathic traits into crop plants
* Breeding varieties that compete with weeds, e.g., corn varieties that germinate early
* Biological weed control - using pathogens and insects

Insect Control

- Crop rotations
- Effects of crop diversity, such as crop rotations, intercropping, and narrow stripping on beneficial insect populations
- Integrated cultural and biological approaches to insect management
- Strategies enhancing effects of beneficial insects
- Integrated Pest Management, as originally conceived, with cultural and biological methods preferred to chemical ones
- Effects of fertility systems on insect systems
- Leaching from insecticide applications

Plant Disease and Nematode Control

- Crop rotations
- Effects of fertility systems on plant diseases
- Effects of crop diversity on plant diseases
- Composting to control fungal and other plant diseases
- Resistant crop varieties (either through traditional plant breeding or genetic engineering techniques)
- Innoculating seed with pathogen-inhibiting organisms

Soil Nutrients

- Nutrient cycling on the entire farm; whole farm nutrient budgeting
- Nutrient cycling within fields over time - different crops and root systems
- Effects of tillage on nutrient cycling
- Rotation effects on nutrient cycling
- Manure-handling - low-cost systems for storage and application
- Alternatives to chemical fertilizers for nutrient sources
- Urban nutrient sources - to work towards closing the cycle to return urban nutrients to farms
- Long-term release and fluctuations of deeply stored P and K; Are university "maintenance" fertilizer recommendations appropriate?; Is "soil mining" actually happening?
- Stimulating microbial fraction of soil to make nutrients available
- Balance among nutrients (and not their absolute levels) and their effects on crop yields and quality
- Micro-nutrients - effects on crop yields and quality
- New soil tests to determine actual nutrition levels under systems that don't depend on chemical fertilizer applications
- N credits from green manure and manure combined
- Composting

Cropping Systems

* Strategies to make transition from conventional to lower chemical farming practices, with minimal or no decrease in yields and income and no dramatic increase in labor or equipment
* Effects of cropping systems on soil physical properties such as compaction, structure, organic matter content
* Agroforestry Systems
* Increased use of perennials
* On-farm processing of farm products; and non-food uses of sustainable crops and not unsustainable ones (e.g., corn)
* Companion planting for nutrients and insect control
* Rotational grazing systems
* Cover crop systems - species and varieties, methods of establishing and incorporating
* Water management systems
* Practices that reduce use and increase efficiency of fossil fuels in agriculture

Livestock Systems

Research should support systems in which animals are raised, their feed is grown and their manure is returned to the same land.

* Rotational grazing
* Pro-biotics - alternatives to feedstuffs with antibiotics
* Effect of levels of chemicals used to grow crops and crops' nutritional quality on herd health and production
* Livestock breeding for maximum utilization of roughage and lower quality feed
* Alternative feedstuffs to corn and soybeans
* Energy efficient and low-cost housing and feeding and manure management systems, using local materials
* Pest control without chemicals (modifying diet, using traps, etc.)
* Bio-assays (as opposed to chemical assays) for feed quality

Attachment #2

Attachment 2

A PROPOSED SUBSTITUTE FOR SEC. 402 of S. 970
CONCERNING THE EXTENSION SERVICE
SUBMITTED BY THE SUSTAINABLE AGRICULTURE COALITION

JUNE 1989

TITLE IV – RESEARCH AND EXTENSION

Sec. 402. Sustainable Agriculture Extension Program

(a) **Establishment of Program** – There is hereby established within the Extension Service a Sustainable Agriculture Extension Program.

(b) **Head of Program** – The head of the Sustainable Agriculture Extension Program shall report to the head of the Extension Service.

(c) **State Extension Sustainable Agriculture Coordinator** – In order to implement the purposes of this title within each state, the Sustainable Agriculture Extension Program shall assign to each state a Sustainable Agriculture Extension Coordinator. The Coordinators shall report to the head of the Sustainable Agriculture Extension Program.

(d) **Regional Specialists** – In order to assist county agents and farmers implement the purposes of this title, the Sustainable Agriculture Extension Program shall designate, within each state, regional sustainable agriculture specialists. The Specialists shall report to the State Coordinator.

(e) **General Purpose** – The purpose of the Sustainable Agriculture Extension Program shall be to provide information, analysis, training, education, and technical assistance to farmers attempting to design and implement sustainable agricultural systems. Extension activities shall be directed to information, analysis, training, education, and technical assistance concerning technologies, methods, and systems that can be used effectively by, and are particularly appropriate for, small and moderate-sized family farms.

(f) **Specific Duties** – Among its specific duties, the Sustainable Agriculture Extension Program shall–

(1) collect, evaluate, and disseminate existing information on sustainable agriculture;

(2) research, revise, update, and re-issue, as appropriate, bulletins and other publications in the extension service archives concerning sustainable agricultural practices, methods, and systems;

(3) validate, demonstrate, and disseminate information on sustainable crop and livestock systems;

(4) encourage and cooperate in on-farm participatory research and validation activities through integrated efforts by extension agents, farmers, and sustainable agriculture organizations;

(5) assist in developing farmer-to-farmer information exchange networks to enable farmers making conversions to more sustainable farming systems to share ideas and draw on each other's experiences;

(6) develop farmer training corps that can serve as as supplements and assistants to extension agents in providing training and technical assistance to other farmers;

(7) coordinate a regular series of sustainable agriculture farm tours and field days within each state;

(8) plan for extension programming, including extensive farmer input and feedback, in the design of new and ongoing research endeavors related to sustainable agriculture;

(9) provide technical assistance to individual farmers in the design and implementation of farm management plans and strategies for making a transition to more sustainble agricultural systems;

(10) consult and work closely with SCS and ASCS in carrying out the information, technical assistance and other functions assigned to the Extension Service under the program established by subtitle D of Title I of this Act; and

(11) develop, coordinate, and direct education and outreach programs in defined areas of groundwater contamination as determined by the well-testing program established by Title III of this Act.

Senator FOWLER. Thank you very much, Ms. Krome.

Dr. Bob Darst, vice president of the Potash & Phosphate Institute (PPI) in Atlanta. Welcome, Dr. Darst.

STATEMENT OF B.C. DARST, VICE PRESIDENT, THE POTASH & PHOSPHATE INSTITUTE, ATLANTA, GA

Mr. DARST. Thank you, Mr. Chairman, Senator Bond. It is a privilege for me to be here.

INTRODUCTION

I work for the Potash & Phosphate Institute—PPI—and the Foundation for Agronomic Research—FAR—in Atlanta.

THE MISSION OF PPI

The mission of PPI is to develop and promote the use of scientifically based crop production information to be used by the farmer, including the use of essential plant food nutrients such as phosphorus and potassium.

FAR

The mission of FAR is to provide industry support for much needed agronomic research, to identify critical research needs, and to provide leadership in implementing research and educational programs at the farm level.

RESEARCH

Since 1980, our organizations have funded 250 research projects, mostly to university and USDA scientists, in 38 States. We build our programs on a research base, then extend the new technology developed from that research through a variety of educational programs.

All the research and education programs we support are designed to allow the farmer to utilize fertilizer more efficiently, both in terms of economics, because he is economically driven, and environmental protection. The following points outline some of the key activities in the decade of the 1980's and are reflective of PPI programs that date back to 1935.

Most PPI/FAR supported research projects are systems oriented. They are designed to look at all inputs, including tillage, cultivation, fertilization, pest control, and management timeliness, for the purpose of evaluating interactions.

Special attention is given to tillage, nitrogen management, water use efficiency, timing, residue management, method of fertilizer placement, and other factors that have potential impact on the environment, particularly ground water quality. For example, in 1990 FAR will be providing support for a TVA contract research project in cooperation with University of Tennessee scientists. Its purpose will be to address the issue of water use efficiency both in terms of economics and ground water protection.

PPI and FAR do not support proprietary research. That is, funded research through our organizations is not designed to promote a particular product or company. Rather, it is aimed at seeking out those new techniques and ideas that will permit the farmer to more efficiently use those products that are available to him.

OUR SUPPORTED RESEARCH

Our supported research, as well as that from other scientific research, has helped to introduce and expand our knowledge base for new farming techniques, that is, for new best management practices that must be implemented on a site-specific basis. Some of those BMP's are included in my written report [exhibit 4].

Balanced inputs, including soil fertility, correct hybrids, timing, tillage, and cultural practices such as crop rotation, have also been treated in that research. Nitrogen management, split applications, proper rates and sources, stabilization in the soil, use of animal manures and legumes have also been included.

Residue management to reduce runoff and surface erosion, improve water rate intake by the soil, and improve organic matter levels, and the use of diagnostic techniques such as soil testing, plant analysis, integrated pest management, all these improve efficiency, but we recognize very strongly that research is not enough. New technology must be transferred to and accepted by the farmer.

We recognize that adoption of BMP's requires farmer education and, therefore, many of our programs are designed to carry technology from the researcher's test plots to the farmer's fields. The absolute key to appropriate use of new BMP's is producer management. PPI and FAR devote considerable effort and funds to improving producer management techniques.

SUMMARY

Although we are supported directly by industry funding, our scientists have always had the professional objectives of planning, designing, and implementing research and education programs that are best suited to efficient use of fertilizers and other inputs by the farmers. They have no sales responsibilities, but devote 100 percent of their time to research and education.

Our programs are organized with optimum farmer profit as a top priority. However, they are also underscored by the need for environmental protection. There is and always has been a constant recognition that proper balance must be given to these two factors—economics and environmental protection. It is our belief that the two go hand in hand. Optimum crop yields, coupled with low unit production costs, provide the protection to the environment and at the same time provide economically for the farmer.

Thank you very much.

[The prepared statement and attached exhibits 1–4 of Mr. Darst follow:]

TESTIMONY OF

Dr. B. C. Darst
Potash & Phosphate Institute
and
The Foundation for Agronomic Research

before the

Senate Committee on Agriculture, Nutrition,
and Forestry
Subcommittee on Conservation and Forestry

June 22, 1989

RESEARCH AND EDUCATION SUPPORT FOR THE U.S. FARMER AS PROVIDED BY THE POTASH & PHOSPHATE INSTITUTE AND THE FOUNDATION FOR AGRONOMIC RESEARCH

Dr. B. C. Darst[1]

Potash & Phosphate Institute

The American Potash Institute was founded in 1935, its charge to determine the need for potash (K)...based on "the recognition of its function as a plant food, which is agronomic, and the ability of the farmer to buy his requirement, which is economic. In fact, the agricultural usage of potash must be increased only on a basis that is sound and profitable to the farmer." Those were the words of Dr. J. W. Turrentine, first President of the Institute, as he spoke to his first Board of Directors meeting.

In 1977, the Institute added market development for the North American phosphate producers to its charge, and became the Potash & Phosphate Institute (PPI). The mission is still the same... scientifically based information...for both phosphate (P) and K, as was outlined by Dr. Turrentine more than 50 years ago.

Foundation for Agronomic Research

The Foundation for Agronomic Research (FAR) was created in 1980 as a sister organization to PPI. Its purpose is to provide industry support for much needed agronomic research, to identify critical research needs and to provide leadership in implementing research and educational programs. Its funds are largely generated from contributions made by corporations and other organizations directly involved in food production, but that are not qualified for PPI membership, not being North American producers of P and K.

The Foundation supports and implements those programs which help to assure the economic stability of farmers and the maintenance of a strong capability for sustained food and fiber production at reasonable costs to the consumer, while using necessary inputs efficiently and appropriately.

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[1] Vice President, PPI, and President, FAR, respectively. Presented to the United States Senate Subcommittee on Conservation and Forestry, June 22, 1989.

Market Development Base: Research and Education

PPI and FAR build their programs on the research base, then extend the new technology developed through a variety of education programs. All research and education programs supported by PPI and FAR are designed to allow the farmer to use fertilizer more efficiently, both in terms of economics and environmental protection. The following points outline some of the key activities in the decade of the 1980s and are reflective of PPI programs dating back to 1935.

Research

Neither PPI nor FAR is engaged in hands-on research. Rather, they provide funding and scientific expertise, primarily to land grant university and USDA scientists, to conduct the actual research.

1. Since 1980 PPI and FAR have funded about 250 research projects in 37 states. A listing of the projects...including states, project titles and scientists...is included as a part of this report (see Exhibits 1 and 2). It should also be noted that research in Canada and other countries is supported by PPI and FAR.

2. PPI and FAR research grants have exceeded $3.5 million in total since 1980.

3. Research supported by PPI and FAR is main line. That is, it fits with the objectives of the assigned responsibilities of the scientist being supported and is relevant to crop production problems in the state or region in which he or she works.

4. Most PPI/FAR supported projects are systems oriented. They are designed to look at all inputs, including tillage, cultivation, fertilization, pest control, and management timeliness.

5. Special attention is given to tillage, nitrogen (N) management, water use efficiency, timing, residue management, method of fertilizer placement and other factors that have potential impact on the environment. For example, in 1990 FAR will be providing support for a Tennessee Valley Authority (TVA) contract research project with University of Tennessee scientists. It will address the issue of N use efficiency in crop production...both from the standpoint of economics and environmental protection.

6. The U.S. PPI staff are all Ph.D. level agronomists with varied technical backgrounds. They cooperate with researchers in their assigned areas and provide input and ideas for project development and implementation.

7. PPI and FAR do not support proprietary research. That is, supported research is not designed to promote a particular

product or company. Rather, it is aimed at seeking out those new techniques and ideas that will permit the farmer to more efficiently use those products that are available to him. It is up to the suppliers of those products, then, to use the new information, as it fits their products, which was created as a result of the research.

Education

Education is the essential connecting link between the researcher and the farmer. PPI and FAR programs are designed to carry new technology from the researcher's test plots to the farmer's fields. The following are a few examples of how this is accomplished.

1. PPI and FAR, working with universities, USDA, industry, grower groups and other agencies, sponsor meetings, workshops, seminars and symposia to extend technology to those leaders who advise and influence the farmer's management decisions. Attendees may include crop consultants, industry agronomists, bankers, dealers, Extension personnel and top farmers. Exhibit 3 summarizes a partial listing of such meetings.

2. PPI and FAR publish and distribute nearly a million pieces of literature each year. They are directed to broad-based agricultural audiences and vary from simple, easy to read pieces to those that are more technical. All are based on scientific research and are designed to increase efficient and environmentally responsible use of fertilizers and other production inputs with the goal of higher profitability for the farmer.

3. PPI works with Extension, industry and other agencies to train the fertilizer dealer. This program has involved hundreds of training programs and thousands of dealers in virtually every state...and important agricultural areas within each state. This program is one of the most vital efforts of PPI because numerous surveys have shown that a majority of farmers rely on the dealer for production information. The dealer must have the latest technology in his hands if he is to properly serve his customer, the American farmer.

4. PPI personnel have been asked to train crop consultants... those paid professionals that work directly with farm customers...in the basics of soil fertility and fertilizer use. These training programs have ranged in scope from local to regional to national meetings. Similar training has been done for Soil Conservation Service personnel.

5. PPI scientists prepare summaries of Best Management Practices (BMPs) for various crops across the U.S. Exhibit 4 illustrates these BMPs for three crops in four different production areas. BMPs are very site-specific; thus, these guides are written for a restricted production area and specific soil conditions. Such an approach is absolutely essential to guarantee best use of inputs for optimum economic

efficiency and maximum environmental protection at each production site.

6. PPI is using every available method of communication...word of mouth, television and radio, the printed word, video, slide sets...to transfer BMPs to the farmer. FAR is now developing a computer program that will permit students, teachers, dealers, agronomists and farmers alike to learn new technology at their convenience.

7. PPI has a fellowship program that provides $2,000 grants to as many as 10 promising young scientists each year. This is a program of which we are most proud because it directs top students into the agricultural sciences at a time when such students are dwindling in numbers.

Summary

Although PPI and FAR are supported directly by industry funding, our scientists have always had the professional objectives of planning, designing and implementing research and education programs that are best suited to efficient use of fertilizer and other inputs by the farmer. They have no sales responsibilities, but devote 100 percent of their time to research and education.

Our programs are organized with optimum farmer profit as a top priority. However, they are also underscored by the need for environmental protection. There is and always has been a constant recognition that proper balance must be given to these two factors...economics and environmental protection. It is our belief that the two go hand in hand. High yields, coupled with low unit production costs, provide for protection of the environment and profit for the farmer.

It is our goal that every dollar we spend on research and education be utilized in such a way that life is made better for the farmer and his customers, consumers in America and around the world, while sustaining...even improving...our environment for future generations.

Exhibit 1

PROJECTS FUNDED THROUGH
THE POTASH & PHOSPHATE INSTITUTE
1980 - 1989

PROJECT #	PROJECT TITLE	LEADER
AL-1	Fertilization requirements for N, P, and K in double cropping of irish potatoes and soybeans.	C. E. Evans
AL-3	Starter fertilizers for ratooning grain sorghum.	J. T. Touchton
ALTA-1	K status of soils in Northwestern Alberta.	J. A. Robertson
ALTA-2	Effects of N form and KCl on common root rot of barley.	R. J. Goos
ALTA-3	Chloride in Alberta soils.	Robinson
AR-1	Salinity potential of different potassium sources.	J. T. Gilmour
AR-2	Lime and fertilizer test demonstrations with soybeans.	A. R. Siler
AR-3	Characterization of water and solute flow in Crowley silt loam soil.	H. D. Scott
AR-4	Cultural practices and varietal characteristics required to produce consistent maximum yield of determinate soybeans.	T. C. Keisling
AR-5	Simulation of nutrient uptake and translocation in crops.	H. D. Scott
ARG-1	Diagnosis of P fertilization in wheat under different environmental conditions in the Southeast Buenos Aires, Agrentina Province.	N. Darwich
ARG-2	Donation of Planet, Jr. Planter to Salta, Agrentina Experiment Station.	A. E. Ludwick
BANG-1	Long-term MYR for higher yields and profits for major Bangladesh cropping patterns.	S. Portch
BC-2	Potassium nutrition and protein production.	A. D. M. Glass
BRAZIL-1	Potassium fertility of sugarcane in leached oxisols in Northeastern Brazil.	J. W. B. Stewart

Page 2
Projects Funded Through PPI
1980 - 1989

PROJECT #	PROJECT TITLE	LEADER
CA-1	Ameliorating effects of potassium fertilization on Verticillium wilt and nutrient uptake of cotton.	D. S. Mikkelsen
CA-2	Phosphorus deficiencies induced in wheat and other upland crops grown on alternately flooded soils; their transformation, soil test diagnosis and correction.	D. S. Mikkelsen
CAN-1	Intensive culture of wheat in Canada.	M. Kraut
CO-1	P fertilization to enhance legume establishment in marginal production situations.	M. R. Buettner
CO-3	Potassium fertilization of alfalfa.	K. A. Barbarick
CO-4	K release and its influence on potassium availability to alfalfa.	D. G. Westfall
CO-6	Management of P fertilizer for dryland winter wheat in reduced tillage systems.	J. L. Havlin A. R. Halvorson
COLO-1	Obtecion de Maximos Rendimentos en Colombia, S. A.	Fierro
CR-1	Studies on soil fertility and fertilization techniques on bananas for the Atlantic area of Costa Rica.	R. A. Rodriquez
CR-2	Study of Costa Rican soils, with low K status and inadequate cationic equilibria.	E. Bornemisza
DE-1	Boron and potassium fertilization and leaching effects on sandy Delaware soils in an intensive corn management system.	D. L. Sparks
DE-2	Effect of timing of K applications on leaching and corn yields in Delaware soils in an intensive management system.	D. L. Sparks
ECU-1	The influence of potassium and phosphorus on a maximum yield corn-soybean double cropping system in Ecuador.	Ing. F. Mite
FL-1	Cooperative research in forest fertilization (CRIFF).	W. L. Pritchett

PROJECT #	PROJECT TITLE	LEADER
FL-2	Influence of intensity and timing of potassium application on the yield of sweet corn, soybeans and cabbage grown in a multiple cropping system.	J. B. Sartain
FL-4	Sulfur coated nitrogen and potassium slow release fertilizer evaluation with four tropical grass species.	R. S. Kalmbacher
FL-5	Pathway of mineral nutrients from the root surface to the Xylem.	R. C. Smith
FL-6	Maximum economic yields of corn, soybeans, and wheat in multicropping systems as influenced by fertility, fertilizer placement, nematocides, fungicides, and water.	D. L. Wright
GA-2	Rate, time, and method of P-K fertilization on multiple cropping (several projects).	W. L. Hargrove
GA-3	Georgia Plant Food Educational Society.	
GA-5	Optimization of potassium, calcium and magnesium levels in profile modification experiments.	M. E. Sumner
IA-1	Tillage methods and the response of corn to K in Iowa.	J. R. Webb
IA-4	Electrochemical determination of plant available K in soils.	A. D. Scott
ID-2	The potential role of pop-up P and K applications in realization of MY of wheat in varieties in the Pacific Northwest.	R. L. Mahler
IL-1	Factors influencing the efficiency of fall and spring applied nitrogen.	R. G. Hoeft L. F. Welch
IL-4	Influence of applying P and K on yield and other responses of alfalfa under varying management.	R. P. Walgenbach
IL-3	Potash fertilization rates and timing trials for maximum production of tomato varieties on irrigated sandy Illinois soils.	J. M. Swaider

PROJECT #	PROJECT TITLE	LEADER
IL-8	Alfalfa K requirements on a low fertility soil at Dixon Springs Research Center in southern Illinois.	W. M. Walker
IL-9	K requirements for high yields.	R. G. Hoeft
IN-1	Interaction of K with N levels used in corn production.	S. A. Barber
IN-3	Phosphorus and potassium fertilization of corn and soybeans grown in rotation in Indiana.	D. B. Mengel
IN-7	Interactions of N, K and the kernel N sink involved in maximizing grain yield of corn hybrids.	C. Y. Tsai
IN-9	Potassium fixation in clays due to the reduction of structural ferric iron.	C. B. Roth P. F. Low
INDIA-1	Maximum yield research.	Sekhon
INDO-1	Effect of soil cover and land clearing methods on the maintenance of soil fertility and performance of food crops in the Sitiung Transmigration area of West Sumatra.	I. H. Basri
KS-1	Nutrient requirements of maximum yield alfalfa.	D. A. Whitney
KS-2	Effect of available P and carbon exudates from plant roots on yield of corn.	D. E. Kissel
KS-3	Optimizing nitrogen and phosphorus placement for maximum yield of wheat.	D. E. Kissel
KS-4	Response of diverse wheat types to P and K nutrition.	G. M. Paulsen
KS-5	Fertilizer management for irrigated crops in southeast Kansas.	R. E. Lamond
KS-7	Evaluations of fertility requirements for high yielding semi-dwarf wheats.	R. E. Lamond

PROJECT #	PROJECT TITLE	LEADER
KS-8	Fertilizing furrow-irrigated corn with phosphorus and potassium at the Colby Branch Experiment Station.	H. D. Sunderman
KS-9	Corn hybrid performance test under maximum yield conditions.	H. D. Sunderman
KS-13	N-P-K placement for grain sorghum in ridge-plant, no-till and reduced tillage systems.	D. W. Sweeney
KS-14	Phosphorus, potassium and chloride effects on charcoal rot in soybean cultivars.	G. V. Granade
KY-1	Corn and soybean high yield irrigation study.	L. W. Murdock
KY-2	Rotation study on hill land.	K. L. Wells
KY-3	Potassium requirement of the dairy cow.	R. W. Hemken
KY-4	Effect of soybean row width on yield at different rates of P and K.	J. H. Herbek
LA-1	Yield of forage crop and soil chemical properties as influenced by K fertilization.	D. L. Robinson
LA-4	Yield and quality of bermudagrass and soil chemical properties as influenced by fertilizer applications.	D. L. Robinson
LA-5	Soybean response to P, K, and S on a low P, K, and S soil in southcentral Louisiana.	W. B. Hallmark
MB-2	Assessing chloride fertilizer requirements of wheat and barley grown on Manitoba soils.	D. N. Flaten
MD-1	Maximum forage production on hill lands.	A. M. Decker
MN-1	High corn and soybean yield trials on the coarse textured, irrigated soils of Minnesota.	G. L. Malzer
MN-2	Phosphorus and potassium fertility studies on sunflower.	G. E. Varvel
MN-3	Maximizing corn and soybeans in southern Minnesota.	G. W. Randall

PROJECT #	PROJECT TITLE	LEADER
MN-4	Maximizing the yield and persistence of irrigated alfalfa in Central Minnesota.	C. C. Sheaffer
MN-5	Physiological influence of potassium on development of cold hardiness in alfalfa.	C. C. Sheaffer M. P. Russelle
MN-6	Influence of N and K on the yield and nutrient accumulation of different corn hybrids.	G. L. Malzer
MO-1	Phosphorus and potassium requirements for high yielding alfalfa in a low P and K soil in southcentral Missouri.	D. D. Buchholz
MO-2	Calibrate available soil phosphorus level to crop response based on available soil moisture and rainfall.	R. G. Hanson
MO-5	Effect of maize genotype and potash levels on stalk strength and grain yield.	L. L. Darrah
MO-8	Phosphorus fertilization to maximize soybeans and grain sorghum yields under conditions of irregular rainfall.	R. G. Hanson
MT-1	Winter wheat quality relative to fertilization with sulfate, chloride, phosphate, and nitrogen.	V. A. Haby
NC-1	The mobility of phosphorus in high organic matter, sandy soils, and utilization of P by blueberries.	G. A. Cummings
NC-2	Alfalfa yield potential in North Carolina.	J. P. Mueller
NC-7	Dynamics of K supply to corn and soybeans in an intensive management of cropping systems.	E. J. Kamprath
NC-8	Alfalfa fertility needs in a high yielding no-till system in North Carolina.	J. P. Mueller
ND-1	Nitrogen and phosphorus placement for wheat production in North Dakota.	R. J. Goos
ND-3	Wheat workshop in North Dakota.	E. H. Vasey

PROJECT #	PROJECT TITLE	LEADER
NE-1	Potassium fertilization for irrigated alfalfa; potassium and magnesium for irrigated corn on the sandy soils of Nebraska.	G. W. Rehm
NE-3	Effect of depth of placement and time of application on the performance of phosphorus fertilizers for winter wheat production.	D. H. Sander
NE-4	Phosphorus fertilization of irrigated alfalfa in the eastern Great Plains.	G. W. Rehm
NE-5	Evaluation of placement of fertilizer -- P for corn production on P deficient soils in the eastern Great Plains.	D. H. Sander
NE-6	Increasing the efficiency of fertilizer P on winter wheat.	D. H. Sander
NJ-2	A long-term soil fertility study with a corn and soybean rotation.	R. L. Flannery
NJ-3	Soil test correlation with snap beans.	J. W. Paterson
NJ-4	Vegetable fertilization via drip/trickle irrigation.	J. W. Paterson
NJ-5	The influence of soil and crop management practices on corn grain production on irrigated freehold sandy loam soil.	R. L. Flannery
NJ-6	Residual effect of phosphate fertilizer in acidic soils.	Pa Ho Hsu
NJ-9	Identification of leaf-potassium as a buffer against deleterious water deficit effects on photosynthetic potential.	G. A. Berkowitz
OH-2	Effect of applied and residual phosphorus and potassium on soybeans.	J. W. Johnson
OK-1	Determining N, P, and K needs for several crops in Oklahoma.	R. L. Westerman
OK-3	Pasture and forage demonstrations in Oklahoma.	L. M. Rommann

PROJECT #	PROJECT TITLE	LEADER
OK-4	Oklahoma Forage and Grassland Council.	
ONT-1	Soil test calibration program for perennial forages.	R. W. Sheard
ONT-2	Effect of soil and crop management factors in corn and soybean growth and yield in southwestern Ontario, Canada.	C. K. Stevenson
ONT-3	A maximum alfalfa yield project for Ontario.	R. W. Sheard
ONT-4	Maximum corn yield at Elora, Ontario.	M. H. Miller W. K. Walker
OR-1	Effects of P and lime on yield, P concentration and severity of take-all root rot.	T. L. Jackson E. P. Winters
OR-2	Influence sources of N and sources of K on take-all root rot of wheat.	T. L. Jackson
OR-3	Northwest Plant Food Association's soil improvement committee project.	
OR-6	Factors associated with 12 ton alfalfa yields under irrigation in eastern Oregon.	M. R. Buettner
PA-1	Pennsylvania Alfalfa Grower's Program.	S. C. Bosworth
PA-2	Soil plant relationships in the potassium fertilization of alfalfa.	L. E. Lanyon
PA-3	Phosphorus fertilizer response in experimental alfalfas selected for extremes in phosphorus concentrations.	J. L. Starling
PA-4	The transaction of alfalfa regrowth vigor, harvest frequency and soil fertility regime.	W. C. Stringer
PERU-1	Soil fertility evaluation for maximum economic yield production systems on ultisols and oxisols.	P. A. Sanchez
PHIL-1	Field evaluation of soil and crop management factors on corn growth and yield in the Philippines.	P. P. Pamplona

PROJECT #	PROJECT TITLE	LEADER
QUE-1	Maximum yield in corn-grain.	A. F. Mackenzie
SASK-1	Effects of K fertilization on development of spring and winter wheat in prairie region.	D. A. Rennie D. B. Wilkinson
SASK-2	Residual phosphates and maximum productivity. Maximum yields in Canadian Prairie soils-investigation on the efficiency of large broadcast applications of fertilizer phosphate over an 8-year period.	J. W. B. Stewart
SASK-3	Western Phosphate Travel Fund.	
SASK-4	Maximum spring 3M wheat yield for south-western Saskatchewan.	C. A. Campbell
SASK-6	Influence of potassium chloride and polyphenols on the dynamics of the release of manganese from soils.	P. M. Huang
SASK-7	Maximum yield canola production.	E. Bendig
SC-2	South Carolina Plant Food Education Society.	
SC-4	Effects of N-P ratio in starter fertilizers on irrigated corn in South Carolina.	J. P. Zublena
SC-5	N-K interactions and their effects on amino acid content of triticale varieties.	C. L. Parks D. C. Gooden
SD-1	The influence of chloride additions on spring wheat in South Dakota.	P. E. Fixen
SUM-1	Potassium problems in oil palm in N. Sumatra.	H. von Uexkull
TAI-1	Maximum yield and maximum economic yield in soybean using various crop management inputs in the tropics.	Shanmugasundaram
TN-1	Fertilizer for extension soybean and crop fertilization demonstrations.	J. R. Jared
TN-2	Nutritional and cultural studies of high yielding soybean soils of Tennessee.	G. M. Lessman
TX-1	Response of major crops in Grand Prairie area to K, S, Zn and B.	A. A. Croix

PROJECT #	PROJECT TITLE	LEADER
TX-2	Response of east Texas forages to fertilization (4 demo. locations).	J. N. Pratt
TX-3	Crop response to phosphorus and potassium fertilization on coastal bend soils.	J. E. Matocha
TX-4	Economics feasibility of intensive forage and livestock management.	J. T. Long
TX-5	Potassium fertilization rates and sources on Coastal bermudagrass at Overton, TX.	L. R. Nelson
TX-6	The influence of potash and phosphate on the yield and quality of cottonseed in the Southern High Plains.	N. W. Hopper
TX-7	Legume-grass response to fertilization.	D. J. Dorsett
UT-1	Potassium and phosphorus fertilizer utilization as affected by soil and water salinity.	R. J. Wagenet
VA-1	The effect of plowsole placement of phosphorus and lime on yield and quality of alfalfa for selected Piedmont soils.	R. B. Reneau
VENZ-1	MYR grain sorghum for Venezuela.	E. Casanova
WA-1	Influence of chloride ions and certain macro-micro-elements on take-all of wheat.	R. J. Cook
WA-2	Potassium and phosphorus requirements for maximum potato yield.	S. Roberts
WA-3	Responses by wheat to K and P fertilizer under different management systems.	F. E. Koehler
WA-6	The role of phosphorus in maximizing growth of *Pseudotsuga menziesii* and *Tsuga heterophylla* on Coastal Hemlock soils of the Pacific Northwest.	R. J. Zasoski
WI-1	High yields of alfalfa production through the diagnosis and recommendation integrated system (DRIS).	K. A. Kelling

PROJECT #	PROJECT TITLE	LEADER
WI-2	Calibration of the soil phosphorus test for conservation tillage.	E. E. Schulte
WI-3	Yield potentials of corn on plano silt loam.	E. E. Schulte
WI-4	Effect of soil P and K and broadcast N on response of corn to row fertilizer.	E. E. Schulte
WI-6	Dual placement of nitrogen and phosphorus on corn in Wisconsin.	P. E. Fixen
WI-7	Investigation of soybean response to potassium and nitrogen under high yield environments.	E. S. Oplinger
WY-1	Sugar beet varieties -- some factors influencing germination.	H. W. Hough
WY-2	Effect of P, K and P sources on yield and quality of alfalfa.	W. H. Bohl

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Exhibit 2

PROJECTS FUNDED THROUGH
THE FOUNDATION FOR AGRONOMIC RESEARCH
1980 - 1989

PROJECT #	PROJECT TITLE	LEADER
AL-2F	Potassium requirements for ratooning sweet sorghum production.	J. T. Touchton
AL-4F	Starter fertilizers for no-tillage systems.	J. T. Touchton
AL-5F	Yield potentials for doublecropped corn and grain sorghum and wheat and soybeans grown in a maximum yield environment.	J. T. Touchton
AL-6F	Starter fertilizer combination and rates for no tillage corn and soybeans.	J. T. Touchton
AL-7F	Maximum yield alfalfa in Alabama.	C. C. Mitchell
AL-8F	Availability of P in P fertilizers with different water solubility.	G. L. Mullins
AR-6F	Maximum production in a multiple cropping sequence in the southern Mississippi Delta.	J. T. Batchelor
AR-7F	Combining technology from interdisciplinary areas for maximizing wheat yields on specific soils in Arkansas.	B. R. Wells
AR-8F	Development of a comprehensive, interdisciplinary research program to maximize rice yields on major rice producing soils of Arkansas.	B. R. Wells
AR-9F	Soil fertility management of selected soils following precision leveling.	B. R. Wells
AR-10F	Improving cotton production on compacted soils.	S. McConnell
AZ-1F	Fertilizing alfalfa for producing 15 tons of forage per acre in an arid environment.	M. H. Schonhorst
AZ-2F	Cotton management for six bale yields in central Arizona with drip irrigation.	B. B. Taylor
BC-1F	Development of method of field applications of variable rates of fertilizers.	H. Schreier
BC-4F	MYR on winter wheat.	A. A. Bomke

PROJECT #	PROJECT TITLE	LEADER
CA-3F	Proposal for cooperative maximum yield research plots at Davis, California.	B. H. Beard R. L. Cooper
CA-4F	Maximum animal gains with phosphorus and sulfur fertilization of clover pastures in northern California.	M. B. Jones
CA-5F	Soil fertility and water management to maximize grape yield and quality in California vineyards.	M. A. Matthews
CA-6F	Systems for maximum irrigated cotton yields in the San Joaquin Valley.	K. G. Cassman T. A. Kerby
CA-7F	Maximizing wheat and barley yields in California with conservation tillage systems.	G. S. Pettygrove
CA-8F	Management of vine potassium and water status for optimum yield and fruit quality in premium wine grapes.	M. A. Mathews
CA-9F	Effects of sidedressed potassium on yield and quality of processing tomatoes in the Sacramento Valley.	G. Miyao
CHINA-1F	Studies on the role of organic manures in balance sheet of nutrient elements in rice-cropping systems.	M. Hasegawa
CO-2F	Nitrogen and phosphorus fertilization of winter wheat and other crops.	R. H. Follett D. G. Westfall
CO-5F	Maximum yield research in Colorado.	P. N. Saltanpour
CO-6F	Management of P fertilizer for dryland winter wheat in reduced tillage systems.	A. Halvorson
CO-7F	Nitrogen use efficiency by corn supplied with various ratios of NH_4+ and NO_3- forms.	S. R. Olsen
FL-3F	Nutritional requirements of high yield cropping systems in the Southeast.	F. M. Rhoads

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Projects Funded Through FAR
1980 - 1989

PROJECT #	PROJECT TITLE	LEADER
FL-7F	Fertilizer requirements for biomass production.	R. L. Stanley
FL-8F	Florida sugarcane response to furrow applied P & K.	D. L. Anderson
FL-9F	Fertilization with P, K, and Mg for triticale-soybean systems.	F. M. Rhoads R. D. Barnett
GA-1F	Diagnostic leaf and soil norms for soybeans in relation to remedial fertilizer practices.	M. E. Sumner
GA-4F	Soil fertility interactions -- the quest for maximum economic yields.	W. I. Segars
GA-6F	High yield corn and peanuts at Tifton, GA.	D. G. Bullock
GA-7F	Maximum economic yield research on wheat and triticale.	J. W. Johnson W. L. Hargrove
GA-10F	Maximizing rapeseed yields in Georgia.	P. L. Raymer J. M. Woodruff
HI-1F	Soil nutrient status and fertilizer requirements in the tropics: A soil phosphorus and potassium atlas for the tropics.	R. L. Fox
IA-2F	Effect of phosphorus and potassium placement on corn yield and growth as influenced by tillage-induced soil and plant residue.	R. M. Cruse D. R. Timmons
IA-3F	Maximizing soybean yields in Iowa.	D. K. Whigham
ID-1F	Cultural practices for maximum yields (180 bu/A) of winter wheat.	B. D. Brown
IL-2F	Nutrient (P and K) requirements for maximum corn and soybean yields.	L. F. Welch
IL-5F	Grain yield potential of corn hybrids developed for high yield environment.	R. J. Lambert
IL-6F	The effects of variation in levels of nitrogen, phosphorus, and potassium on the stalk quality of maize.	F. E. Below
IL-7F	Optimal significance levels for agronomic experiments.	S. G. Carmer

PROJECT #	PROJECT TITLE	LEADER
IL-9F	K requirements for high yields.	R. G. Hoeft
IL-10F	Winter wheat management for maximum yields.	E. D. Nafziger
IN-2F	Purdue 300/100 high yield management project.	R. L. Nielsen L. E. Schweitzer
IN-4F	Effects of varying depth of primary tillage on physical properties, nutrient profile, and yields on a Chalmers soil.	D. B. Mengel
IN-5F	Maximizing soft red winter wheat yields in Indiana.	C. L. Harms H. W. Ohm
IN-6F	North American Economist-Agronomist Workshop - June 24-25, 1982.	W. L. Nelson
IN-7F	Interactions of nitrogen, potassium, and the kernel sink involved in maximizing grain yield of corn hybrids.	C. Y. Tsai
IN-8F	Effect of subsoil tillage and fertilization on maximum yields in Indiana.	S. A. Barber
KS-6F	Suppression of hail damage to irrigated corn through fertigation.	M. L. Hooker
KS-10F	An evaluation of relay intercropping soybeans into winter wheat in southeast Kansas.	R. E. Lamond
KS-11F	Use of high physiological quality (high N - high P) seed to maximize wheat grain yields.	G. M. Paulsen
KS-12F	Effects of sulfur on winter wheat yields and quality components.	R. E. Lamond
KS-15F	Management of cultural practices for maximum yield production of irrigated grain sorghum in the High Plains.	M. L. Hooker
KS-16F	Maximum dryland and irrigated winter wheat yields in the Central Great Plains.	J. L. Havlin

PROJECT #	PROJECT TITLE	LEADER
KS-17F	Fertilizer phosphorus management for dryland winter wheat.	J. L. Havlin
KS-18F	Phosphorus, potassium and chloride effects on leaf rust, speckled leaf blotch, and tan spot in six wheat cultivars.	G. V. Granade
KY-5F	Nutritional limitations to doublecrop (wheat-soybeans) productivity in Kentucky.	J. H. Grove
KY-6F	Influence of tillage rotation on the potassium nutrition of crop components in a strip crop rotation.	J. H. Grove
LA-2F	Fertilization of sugarcane with high populations.	R. Ricaud
LA-3F	Effects of P, S, Mg and K fertilization on Coastal bermudagrass.	M. M. Eichhorn
LA-6F	Optimum potash and phosphate levels for high crop yields in Louisiana.	D. D. Scott
LA-7F	Louisiana maximum economic yield forage and beef demonstration.	D. L. Jones
LA-8F	Fertilizer needs of succession planted sugarcane.	R. Ricaud
LA-9F	Determining lime, P, K and S inputs to obtain optimum soybean yields in Louisiana.	W. B. Hallmark
MAN-1F	Maximizing the effectiveness of nutrients for top yield of barley, flax and rapeseed.	W. H. Toews
MD-2F	Improved management strategies of maximizing wheat and doublecropped soybean production in Maryland.	D. J. Sammons
MD-3F	Intensive management procedures for maximizing wheat and barley yields using tractor mounted equipment on large field plots.	D. J. Sammons
MD-4F	An intensive management wheat program on three wheat cultivars at four different climatic locations in Maryland.	F. R. Mulford

PROJECT #	PROJECT TITLE	LEADER
MD-5F	The effect of potassium applications on pest management decisions in alfalfa.	L. R. Vough
MD-6F	Building a maximum yield cropping system for corn, wheat, and double-cropped soybeans.	P. R. Thomison W. J. Kenworthy F. R. Mulford
MI-1F	High corn yield study.	M. L. Vitosh
MI-2F	Maximum yield of alfalfa - 10 tons hay per acre without irrigation.	M. D. Tesar
MI-3F	Maximum yields of winter wheat.	D. A. Reicosky
MN-7F	Evaluation of combinations of potassium fertilizer, variety, and fungicide use on the production of high yielding soybeans in Minnesota.	G. W. Rehm
MN-8F	Increasing farm profitability with improved recommendations for the use of phosphate.	G. W. Rehm P. E. Fixen W. C. Dahnke
MO-3F	Alternating planting schedules to improve soybean productivity in Missouri.	H. C. Minor
MO-4F	Interactions of soil populations of *Macrophomina phaesolina* and crop infestations as affected by soil fertility levels.	T. D. Wyllie
MO-6F	Yield and yield component response of winter wheat to high yield regime.	J. A. Schaffer
MO-7F	Breeding wheat for intensive management.	N. M. Cowan
MO-9F	Nitrogen management in conservation tillage corn production.	D. D. Buchholz
MO-10F	N/fungicide relationships and P and micronutrient availability in furrow irrigated rice.	P. Tracy
MS-1F	Potassium fertilization - cyst nematode relationships in field grown soybeans.	W. F. Jones
MS-2F	Interdisciplinary research and technology for maximizing wheat yield on selected soils in Mississippi.	N. W. Buehring

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Projects Funded Through FAR
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PROJECT #	PROJECT TITLE	LEADER
MS-3F	Investigations on input interaction effects on cotton yields.	D. A. Pennington
MT-2F	Maximized corn silage yields in response to interactions of nitrogen, phosphorus and potassium fertilizers under irrigated conditions.	V. A. Haby
MT-3F	Maximizing yield and improving quality of irrigated and dryland wheat in Montana.	V. A. Haby
MT-4F	Maximizing winter wheat production with conservation tillage in the Northern Great Plains.	G. Jackson
MT-5F	Maximum barley production under varying soil moisture regimes.	R. E. Engel
MT-6F	Maximizing no-till dryland cereal grain yields in the Northern Great Plains through precise fertilizer placement.	J. W. Bauder
MT-7F	Interaction of drip-applied potassium with soil nutrients.	N. Callahan
MT-8F	Kinetics of phosphate precipitation in the presence of water soluble soil organic matter.	W. Inskeep
NC-3F	Maximum yield studies with corn and soybeans.	J. R. Anderson E. J. Dunphy
NC-4F	Sequential cropping of corn, sorghum, and small grain to achieve maximum silage and TDN production in North Carolina.	J. P. Mueller J. R. Anderson
NC-5F	Improved response to narrow row spacings in maximum yield experiments.	J. R. Anderson
NC-6F	The transfer of maximum yield research technology to farmers.	J. R. Anderson
NC-8F	Alfalfa fertility needs in a high yielding no-till system.	J. P. Mueller J. T. Green
NC-10F	Nitrogen and phosphorus use in "Nutrient Sensitive Watersheds": Development and demonstration of appropriate MEY systems.	J. R. Anderson

PROJECT #	PROJECT TITLE	LEADER
NC-11F	The effect of the form of N on corn yields and nutrient uptake.	E. J. Kamprath
ND-1F	Nitrogen and KCl management for wheat production in North Dakota.	R. J. Goos
ND-2F	Maximizing wheat yields in North Dakota in a crop rotation system.	E. J. Deibert B. K. Hoag
NE-2F	Evaluation of fertilizers as bactericides for plant pathogenic bacteria.	A. K. Vidaver
NE-8F	Survey of Nebraska soils, wheat and corn plants to establish a reference point for assessing potential chloride responsive soils.	K. D. Frank J. S. Schepers D. H. Sander G. W. Hergert
NJ-1F	Influence of corn variety, plant population, irrigation, macronutrients, and micronutrient fertilization on field corn grain yields.	R. L. Flannery
NJ-7F	Vegetable fertilization via drip/trickle irrigation.	J. W. Paterson
NJ-8F	Maximum economic corn and soybean yield demonstrations and implementation phase.	R. L. Flannery
NJ-10F	Influence of irrigation and high fertilization on soil test levels and nutrients absorbed by high yield corn and soybeans during different growth periods.	R. L. Flannery
NRC-1F	Research and policy directions on gene transfer systems applicable to agriculture.	P. Moore
NY-1F	Maximum yield research for alfalfa in New York.	G. W. Fick
NY-2F	Maximizing winter wheat yields in the eastern United States.	W. L. Cox
OH-1F	The effect of potassium supply on efficiency of nitrogen fixation and on assimilate distribution during regrowth of alfalfa.	A. L. Barta

PROJECT #	PROJECT TITLE	LEADER
OH-2F	Effect of residue and placement of potassium on corn yields.	J. W. Johnson
OH-3F	Effect of P and K on maximum yields of corn and soybeans.	J. W. Johnson
OH-4F	Improved phosphorus and potassium fertilizer recommendations for maximum crop yields through alternative uses of existing soil tests.	E. O. McLean
OH-5F	Nutrient status of plant and soil and biomass measurements of soybeans under MY conditions.	R. L. Cooper
OK-2F	Production of consistently high yields of wheat.	R. L. Westerman
ONT-2F	Effect of soil and crop management factors in corn and soybean growth and yield in S.W. Ontario, Canada.	K. Stevenson
ONT-3F	A maximum yield alfalfa project for Ontario.	B. Sheard
OR-5F	Action of chloride fertilizers in ameliorating take-all root rot and stripe rust diseases of wheat.	N. W. Christensen
OR-7F	Soil fertility, plant nutrition, and plant disease interactions affecting potatoes.	T. L. Jackson M. L. Powelson M. J. Johnson
OR-8F	Maximum winter wheat yields on four major soil associations in western Oregon.	N. W. Christensen
OR-9F	N, P and K rate effects on Russet Burbank crop performance and nutrient status in the Klamath Basin.	K. A. Rykbost
PA-6F	Phosphorus and potassium fertility for intensively managed corn and alfalfa.	D. B. Beegle
SASK-5F	Selected factors affecting dynamics and solubility of silicon in soil.	P. M. Huang
SC-1F	Soybeans - all practice study.	H. L. Musen

PROJECT #	PROJECT TITLE	LEADER
SC-3F	Maximization of corn and soybean productivity in South Carolina.	A. Jones J. R. Woodruff
SD-1F	The influence of chloride (KCl) additions on spring wheat in South Dakota.	P. E. Fixen
TN-3F	Special FAR Workshop - Excellence in Research - July 21-22, 1987, Tennessee.	W. R. Thompson
TN-4F	K and B in starter fertilizer for corn and cotton.	D. D. Howard
TX-8F	Maximizing irrigated winter wheat yields in the Southern Great Plains.	A. B. Onken
TX-9F	Response of forages to phosphorus on limed east Texas soils.	V. A. Haby
TX-10F	An audio-visual approach to technology transfer for extension and industry educational programs designed to improve cotton production on the Texas High Plains.	J. R. Abernathy
TX-11F	Soil research project - Texas Tech University.	H. Taylor N. Hopper
UT-2F	Maximizing alfalfa yield and quality within different soil moisture regimes using intensive soil fertility management and best adapted varieties.	D. W. James
UT-3F	Phosphorus and potassium interaction with selected alfalfa cultivars grown on calcareous soils of Utah.	T. A. Tindall
VA-2F	Maximum winter wheat yields for humid region growing conditions.	M. M. Alley
VA-3F	Maximization of soybean and corn productivity in southeast Virginia.	P. H. Reid
VA-4F	Maximum soft red winter wheat yields for humid region growing conditions.	D. E. Brann
VA-5F	Maximum yield of peanuts in Virginia.	M. L. Powell R. W. Mozingo

PROJECT #	PROJECT TITLE	LEADER
WA-4F	Fertilizer requirements for MY corn (grain and silage) under irrigation in Washington State.	S. Roberts
WA-5F	Maximizing land use by intercropping corn with alfalfa or red clover.	S. Kuo
WI-5F	The role of potassium in legume nitrogen fixation, winterhardiness, dormancy and yield.	M. T. Collins
WI-8F	Effects of soil compaction on corn hybrid response to soil K level and row-applied K.	L. G. Bundy
WY-3F	Maximizing yield and protein content of furrow irrigated spring wheat in the intermountain area.	G. D. Jackson

Exhibit 3

MEETINGS SPONSORED OR CO-SPONSORED BY POTASH & PHOSPHATE INSTITUTE (PPI) AND FOUNDATION FOR AGRONOMIC RESEARCH (FAR)

1. Tour of MYR Programs in NC and VA - June 3-5, 1985
2. Potassium in Agriculture Symposium - July 7-10, 1985, Atlanta
3. Research Roundtable for MYR of the Future - Nov. 11-12, 1985, St. Louis
4. Implementing MEY Systems Workshop - Nov. 12-14, 1985, St. Louis
5. Maximum Wheat Yield Research Systems Workshop - March 5-7, 1986, Denver
6. FAR in Action Tour - June 2-4, 1986, NC and VA
7. MEY Spring Wheat Workshop - July 7-10, 1986, Bismarck, ND
8. Implementing MEY Systems Workshop - Nov. 12-13, 1986, St. Louis
9. Starter Fertilizer Workshop - Feb. 19-20, 1987, Atlanta
10. Techniques for Quality Field Research Seminar - July 21-22, 1987, Jackson, TN
11. Central Great Plains Profitable Wheat Management Workshop, Wichita, KS, August 18-20, 1987
12. Profitable Spring Wheat Production Workshop, Fargo, ND, January 6-8, 1988
13. Implementing MEY Systems Workshop, Toledo, OH, Jan. 11-12, 1989
14. Implementing MEY Systems Workshop, Bloomington, IL, February 21-22, 1989
15. Implementing MEY Systems Workshop, Mt. Vernon, IL, February 28-March 1, 1989
16. Implementing MEY Systems Workshop, Ames, IA, March 6-7, 1989

17. MEY Crop Production Systems Conference, Tifton, GA, Sept. 13-15, 1989

18. North American Soybean Research Conference, St. Louis, MO, November 14-15, 1989

19. Intensive Wheat Management Workshop, Denver, CO, March 1990

20. International Canola Conference, Atlanta, GA, April 3-5, 1990

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Exhibit 4

IMPLEMENTING PROGRAMS FOR BEST MANAGEMENT PRACTICES

THE CONCEPT of Best Management Practices (BMPs) carries significance for soil and water conservation, other environmental protection, and agronomic crop production decisions. There are many potential benefits of implementing BMP programs on farms.

Listed here are some features of BMP programs:

- ✓ BMP technology is based on research results of land grant universities.
- ✓ BMP Programs should be continually improved through research and the implementation of new technology.
- ✓ BMP Programs encourage good crop management.
- ✓ BMP Programs include good soil and water conservation practices.
- ✓ BMP Programs have high input efficiency.
- ✓ BMP Programs are farm, soil, and crop specific.
- ✓ BMP Program adoption depends on education.
- ✓ BMP Programs provide flexibility to maintain crop production at desired levels.
- ✓ BMP Programs provide flexibility to release most sensitive environmental-risk acres on a farm.
- ✓ BMP Programs are most successful when crop production and soil conservation practices are integrated into a package proven best for that location. The more proven practices are adopted, the greater the success.

The following pages are examples of how BMP decisions can be adapted to various crops, soil types, and geographic areas. The technology for these practices has been researched and developed. Education and demonstration may be needed to build implementation.

Crop production information prepared by agronomists of the Potash & Phosphate Institute (PPI), based on research and extension demonstration information from USDA and land grant universities.

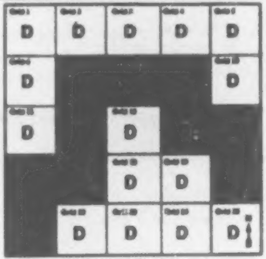
BEST MANAGEMENT PRACTICES (BMPs) FOR HARD RED WINTER WHEAT IN KANSAS

Data for this example.

Field size:	100 acres	**Average wheat yield for this soil:**	31 bu/A
Land description:	Harney silt loam. A Class One productivity soil in the central dryland region of Kansas.	**Current wheat yield base for this farmer:**	31 bu/A

Selected Soil and Water Conservation BMPs:

Factor	Current Practice	Recommended BMP	Environmental Advantages
Terraces	Partial	Complete	Slows water run-off; less soil erosion
Grass waterways	None	Install grass waterways	Less soil loss from surface drain areas (see map)
Tillage	Disk-sweep, clean till	Chemical fallow-sweep	Reduce soil erosion; increase water infiltration
Wind erosion	No control, except emergency chisel	Adequate surface residue from chemical fallow	Reduce soil loss due to wind
Land environmental impact rating	None	Yes (see map)	



Environmental Impact Rating:

Designation	Rating	Grid Numbers
A	Very Severe	none
B	Severe	none
C	Moderate	7,8,9,12,14,15,16,17,20,21
D	Slight	all others

▨ **Indicates Potential Release Acres When BMP Management Is Used On Remaining Acres.**

NOTE: The map at right represents a 100-acre field. A soil and water conservation plan should include a rating of the land as to its vulnerability to environmental pollution. This rating can be done on a grid basis (see map) so that those acres most vulnerable to erosion and water pollution can be released (set-aside) first as farmers adopt BMPs. In many situations, the erodible land is the least productive. It can be released from cropping without reducing production on the individual farm.

Selected Agronomic BMPs:

Factor	Current Practice	Recommended BMP	Environmental Advantages
Certified seed	Bin-run seed	Use certified seed	Quicker emergence
Variety	Old standard (tall-type)	Best semidwarf in tests	Quicker ground cover
Row-spacing	12-inches	10-inches or 6/14 paired rows	Uniform ground cover
Seeding rate	60 lb/A	Precision planting 280-290 seeds/sq. yard	Earlier cover to protect soil
Rotation	Wheat-fallow-wheat	Sorghum-fallow-wheat	Less pest pressure
Weeds	Occasional spring spray	Chemical fallow, scouting for spring spray	Less soil erosion; chemicals used only when needed; conserve moisture
Diseases	Seed treatment	Seed treatment plus scouting for foliar disease thresholds; potassium chloride (KCl) fertilizer.	Chemicals used only when needed
Nitrogen (N) Management*			
Soil test	None	Soil nitrate test 7 ppm NO_3-N= 56 lb/A 2 feet	N efficiency
Rate	60 lb/A, no basis	100 lb/A based on yield goal and nitrate test	N efficiency
Timing	All preplant	Split: 40 % preplant; 10% at seeding; 50% at tillering	N efficiency

*If animal manure is available for use as a nutrient source, it should be analyzed for N content, applied prior to seeding and incorporated by tillage. The amount of N available from manure would be taken into account in recommendations for preplant N applications. Soluble salt accumulations from manure should be closely monitored under dryland conditions. The practicality of manure use would also be affected by choice of tillage system.

(see other side)

Factor	Current Practice	Recommended BMP	Environmental Advantages
Phosphorus (P) Management			
Soil test	None	15 ppm Bray P-1	
Rate, timing	None	45 lb/A P_2O_5 to build to high soil test level; apply at seeding	Early ground cover
Potassium (K) Management			
Soil test	None	250 ppm (high)	
Rate, timing	None	36 lb/A K_2O as KCl; apply at tiller with N	Reduces chemical input needs; chloride helps disease control
Sulphur (S) Management			
Soil test	None	4 ppm SO_4-S	
Rate, timing	None	20 lb/A S, topdressed with N and K	N, P efficiency

[illegible]

This example is for the central dryland wheat belt in Kansas. Current practices would produce yields in the 30 to 36 bu/A range. Farmers adopting BMPs as outlined would increase the yield potential to the 60 bu/A range. The yield advantage for BMP production provides flexibility to release acreage most environmentally sensitive (see map on other side) and still maintain current total production potential. It would also provide flexibility to increase total production when demand warrants. The implementation of BMPs also increases nutrient efficiency and water use efficiency, while reducing soil erosion potential. The table below summarizes some of the production, environmental and economic advantages of a BMP Program.

Approximate Effects of BMPs on Yield*

Use of certified seed:	4-8 bu/A increase over bin-run seed.
Better weed control:	4-20 bu/A increase over current practice.
Improved fertilizer mgm't.:	8-20 bu/A increase over current practice.
Improved water storage:	5-12 bu/A increase over current practice.
Erosion control:	3-10 bu/A increase over current practice.
Disease control:	3-18 bu/A increase over current practice

*Estimated yield increases are not necessarily additive. Interaction effects with other inputs can change the response. The responses shown are averages from various research trials where these inputs were investigated.

Possible Advantages of BMP Program for Hard Red Winter Wheat Production in Kansas

Factor		Current Practice	Recommended BMPs
Expected yield, bu/A		35	60
Actual yield, bu/A		31	58
Acre release potential from 100 acres to maintain same production		—	46
Total production:			
	with 100 acres, bushels	3,100	—
	with 54 acres, bushels	—	3,132
N rate, lb/A		60	100
N efficiency, bu/lb		0.51	0.58
(Higher protein also results with BMP system.)			
N removed in the grain, lb/A		36	79
N remaining (most in residue), lb/A		24	21
Total N applied, lb		6,000 (100 acres)	5,400 (54 acres)
Total N remaining (most in residue), lb		2,400 (100 acres)	1,134 (54 acres)
Water use efficiency, bu/in		2.6	4.2
Production costs, $/A		130	175
Production costs, $/bu		4.19	3.01
Production costs for field			
	100 acres, $	13,000	—
	54 acres, $	—	9,450
Profit, $/field	100 acres	-1,375 (loss)	—
	54 acres	—	+3,234

NOTE: BMP adoption allows this farmer to release land with the highest degree of sensitivity to environmental factors (see map on other side) and to maintain, or improve, total farm production.

Basis for calculations: Kansas State University. N, $0.20/lb; P_2O_5, $0.22/lb; K_2O, $0.12/lb; S, $0.20/lb. Additional harvest charge, $0.25/bu. Fungicide, $8.00/A. Value of wheat: current practice, 11.0% protein, $3.75/bu; BMP practices, 13.0% protein, $4.05/bu.

Prepared by agronomists of the Potash & Phosphate Institute (PPI) based on research and extension demonstration information from Kansas State University.

BEST MANAGEMENT PRACTICES (BMPs) for CORN (GRAIN) PRODUCTION IN NORTH-CENTRAL IOWA

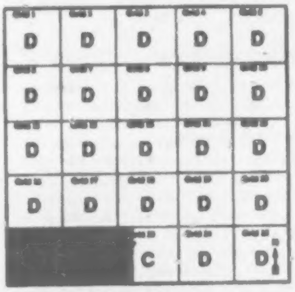
Data for this example.

Field size:	100 acres	Average corn yield for this soil:	150 bu/A
Land description:	Clarion-Nicollet-Webster. A Class One soil, very gently rolling with slight surface drainage waterways.	Current corn grain yield for this farmer:	150 bu/A

Selected Soil and Water Conservation BMPs:

Factor	Current Practice	Recommended BMP	Environmental Advantages
Tillage	Fall chisel	Ridge-plant	Water efficiency; less soil erosion
Compaction	Moderate	Only in controlled wheel tracks.	Water infiltration; nutrient efficiency
Land environmental impact rating	None	Yes (see map)	

Note: The map at right represents a 100 acre field. A soil and water conservation plan should include a rating of the land as to its vulnerability to environmental pollution. This rating can be done on a grid basis (see map) so that those acres most vulnerable to erosion and water pollution can be released (set-aside) first as farmers adopt BMPs. In many situations, the erodible land is the least productive. It can be released from cropping without reducing total production on the individual farm.



Environmental Impact Rating:

Designation	Rating	Grid Numbers
A	Very Severe	none
B	Severe	none
C	Moderate	31, 22, 23
D	Slight	all others

▨ Indicates Potential Release Acres (9) When BMP Management Is Used On Remaining Acres.

Selected Agronomic BMPs:

Factor	Current Practice	Recommended BMP	Environmental Advantages
Plant population	23,000/A	27,000/A	Nutrient and water efficiency
Planting date	April 28 to May 8	April 26 to May 3	Earlier ground cover
Hybrid maturity	105-day	115-day	Higher yield potential
Weed control	Preplant incorporated, full rate	Band apply grass herbicide; scout and use only if needed	Less chemical used
Disease control	None	Scout; limited need with ridge-plant	Chemicals used only as needed
Nitrogen (N) Management			
Soil test	No	Soil nitrate test 6 ppm NO_3-N, 0-1 foot	N efficiency
Rate*	135 lb/A	130 lb/A	Less N used
Timing	All preplant broadcast	25 lb/A starter, 105 lb/A point-injected at V6 growth stage	Greater N efficiency and less subject to loss

* N credits from manure would be substituted whenever available. Legume N credits have been used for soybeans in both cases.

(see other side)

Factor	Current Practice	Recommended BMP	Environmental Advantages
Phosphorus (P) Management			
Soil test	Yes-high	Yes-high	
Rate, timing	60 lb/A, broadcast in spring	35 lb/A fall, 25 lb/A band starter	Better efficiency of P and other inputs
Potassium (K) Management			
Soil test	Yes-high	Yes-high	
Rate, timing	50 lb/A , broadcast in spring	35 lb/A fall, 15 lb/A band starter	Better efficiency of N and P
Sulphur (S) Management			
Soil test	No	Yes, but not common	
Rate, timing	None	Application in starter, by soil test and/or plant analysis	Better early growth; efficiency of N and P
Micronutrients			
Soil test	No	Yes, but deficiencies uncommon	
Nutrient, rate	None	Where indicated by soil test, 1-2 lb/A zinc in starter	Enhanced plant growth; efficiency of other nutrients

Note: BMPs already used in current practice are: rotation with soybeans; P and K soil tests; scouting for insects; drainage tile; and good soil pH level.

Results and Summary

This example is for northcentral Iowa, on a very productive soil. In this example, the management is good, but can be improved with further adoption of several BMPs as indicated above. Yield potential could be increased 10 to 15% which gives the farmer flexibility to release acreage most environmentally sensitive (see map on other side). The implementation of BMPs also increases nutrient efficiency and water use efficiency. The table below summarises some of the advantages for adoption of BMPs.

Approximate Effects of BMPs on Yield*

Ridge-plant and starter fertilizer	5 to 9 bu/A
Earlier planting of longer season hybrid	5 to 7 bu/A
Increase population	3 to 7 bu/A

*Estimated yield increases are not necessarily additive. Interaction effects with other inputs can change the response. The responses shown are averages from various research trials where these inputs were investigated.

Possible Advantages of BMP Program for Corn (Grain) Production in Northcentral Iowa

Factor	Current Practice	Recommended BMP
Expected yield, bu/A	150	165
Acre release potential from 100 acres to maintain same production	—	9
Total production		
with 100 acres, bushels	15,000	—
with 91 acres, bushels	—	15,015
Phosphorus efficiency, bu/lb	2.5	2.8
N efficiency, bu/lb	1.1	1.3
N remaining (most in residue), lb/A	60	40
Total N applied, lb	13,500 (100 acres)	11,830 (91 acres)
Total N remaining (most in residue), lb	6,000 (100 acres)	3,640 (91 acres)
Water use efficiency, bu/inch	7.0	7.7
Production costs, $/A	330	350
Production costs, $/bu	2.20	2.12
Production costs for field		
100 acres, $	33,000	—
91 acres, $	—	31,850
Profit, $/field 100 acres	4,500	—
91 acres	—	5,687

NOTE: BMP adoption allows this farmer to release land with the highest degree of sensitivity to environmental factors (see map on other side) and maintain, or improve, total farm production.

Basis for calculations: Iowa State University . Corn price at $2.50/bu.

Prepared by agronomists of the Potash & Phosphate Institute (PPI) based on research and extension demonstration information from Iowa State University and University of Minnesota.

BEST MANAGEMENT PRACTICES (BMPs) for IRRIGATED LINT COTTON PRODUCTION IN THE [illegible]

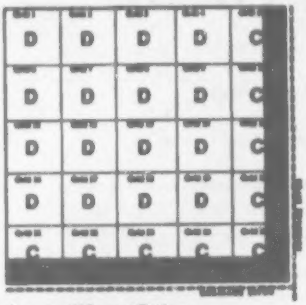
Data for this example.

Field size:	100 acres	**Average lint cotton yield for this soil:**	**800 lb/A**
Land description:	Well drained sandy loam soil with good surface drainage.	**Current lint cotton yield for this farmer:**	**800 lb/A**

Selected Soil and Water Conservation BMPs:

Factor	Current Practice	Recommended BMP	Environmental Advantages
Grass drainage ways	None	Yes	Grass drainage way across end rows to drainage ditch.
Land environmental impact rating	None	Yes (see map)	

NOTE: The map at right represents a 100-acre field. A soil and water conservation plan should include a rating of the land as to its vulnerability to environmental pollution. This rating can be done on a grid basis (see map) so that those acres most vulnerable to erosion and water pollution can be released (set-aside) first as farmers adopt BMPs. In many situations, the erodible land is the least productive. It can be released from cropping without reducing total production on the individual farm.



Environmental Impact Rating

Designation	**Rating**	**Grid Numbers**
A	Very Severe	none
B	Severe	none
C	Moderate	5, 10, 15, 20, 21 - 25
D	Slight	all others

▨ **Indicates Potential Release Acres When BMP Management Is Used On Remaining Acres.**

Selected Agronomic BMPs:

Factor	Current Practice	Recommended BMP	Environmental Advantages
Tillage	Disking; fall subsoiling; several diskings in fall and winter	Fall subsoiling; spring disking	Fuel savings; less particulate matter in atmosphere; erosion control
Seeding rate	70,000/A	55,000/A	Better root and plant growth
Variety	Older standard	Best in comparison test	Greater input efficiency
Nitrogen (N) management	80 lb/A in one application	100 lb/A with 30-40 lb/A in starter, 60-70 lb/A sidedress, depending on soil and/or plant nitrate tests	Greater N efficiency
Lime and pH	No soil test, no lime applied, pH in 5.5 range	Soil test and apply lime to bring pH to 5.8	Improves nutrient efficiency
Phosphorus (P) and potassium (K) management	No soil test to guide P and K application; very little applied	P and K fertilization according to soil test; 80 lb/A K_20 rate on medium soil test, 120 lb/A on low soil test	Improved crop growth; less water runoff; improved lint quality; improved disease resistance
Sulphur (S) and micronutrients	No soil test or plant analysis for guidance; none applied	Apply S, boron (B), and other micronutrients according to soil test and/or plant analysis	Groundwater protection; improved economics for sustainability
Crop protection	Broadbased pesticide use	Crop protection based on field scouting and other diagnostic techniques	Improved N efficiency; groundwater protection; improved productivity; improved crop quality

(see other side)

Results and Summary:

This example is for an excellent soil in the Mississippi Delta region. Current practices would produce lint cotton yields in the 800 lb/A range. Farmers adopting BMPs shown above would increase yield potential to the 1,100 lb/A range. The yield advantage for the BMP production would provide the flexibility to release acreage most environmentally sensitive (see map on other side) and still maintain current total production potential. It would also provide flexibility to increase total production when demand warrants. The implementation of BMPs increases nutrient efficiency and water use efficiency, while reducing soil erosion potential. The table below summarizes some of the production and environmental advantages of a BMP Program.

Approximate Effects of BMPs on Yield*

Seeding rate:	150 lb/A increase over current practice.
Variety:	150 lb/A increase over current practice.
Fertilizer management:	250 lb/A increase over current practice.

*Estimated yield increases are not necessarily additive. Interaction effects with other inputs can change the response. The responses shown are averages from various research trials where these inputs were investigated.

Possible Advantages of BMP Program for Irrigated Lint Cotton Production in the Mississippi Delta

Factor	Current Practice	Recommended BMP
Expected yield, lb/A	800	1,100
Acre release potential from 100 acres to maintain same production	----	27
Total production:		
with 100 acres, lb/A	80,000	-----
with 73 acres, lb/A	----	80,300
N rate, lb/A	80	100
N efficiency, lb lint/lb N	8	11
N removed in cotton, lb/A	52	71
N remaining (most in residue), lb/A	28	29
Production costs for field, $/A	$400	$500
$/lb lint	$0.50	$0.45
Profit, $/field 100 acres	$16,800	----
73 acres	----	$20,513

NOTE: BMP adoption allows this farmer to release land with the highest degree of sensitivity to environmental factors (see map on other side) and maintain, or improve, total farm production.

Basis for calculations: N, $0.20/lb; K_2O, $0.12/lb; lime, $10/A; harvest, $0.10/lb; seed, $0.60/lb; cotton, $0.71/lb.

Prepared by agronomists of the Potash & Phosphate Institute (PPI) based on research and extension demonstration information from the University of Arkansas and Mississippi State University.

BEST MANAGEMENT PRACTICES (BMPs) for SOFT RED WINTER WHEAT IN VIRGINIA

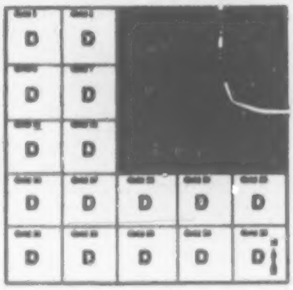
Data for this example.

Field size:	100 acres	Average wheat yields for this soil:	45 bu/A
Land description:	Moderately rolling Piedmont soil with small stream through one corner (see map).	Current wheat yield base for this farmer:	80 bu/A

Selected Soil and Water Conservation BMPs:

Factor	Current Practice	Recommended BMP	Environmental Advantages
Terraces	None	Install terraces	Slow water run-off near stream; decrease soil erosion
Grass waterways	None	Install grass waterways	Grass waterway along stream to slow erosion and water movement
Tillage	Conventional	Minimum-till	Reduce soil erosion, increase water infiltration and reduce soil compaction
Land environmental impact rating	None	Yes (see map)	Identifies for farmer most sensitive environmental area in field

NOTE: The map at right represents a 100-acre field. A soil and water conservation plan should include a rating of the land as to its vulnerability to environmental pollution. This rating can be done on a grid basis (see map) so that those acres most vulnerable to erosion and water pollution can be released (set-aside) first as farmers adopt BMPs. In many situations, the erodible land is the least productive. It can be released from cropping without reducing total production on the individual farm.



Environmental Impact Rating

Designation	Rating	Grid Numbers
A	Very Severe	4, 9, 10
B	Severe	3, 5, 15
C	Moderate	8, 13, 14
D	Slight	all others

▨ Indicates Potential Release Acres When BMP Management Is Used On Remaining Acres.

Selected Agronomic BMPs:

Factor	Current Practice	Recommended BMP	Environmental Advantages
Variety	Old standard	Best in comparison tests	Better input efficiency
Row-spacing	7-inches	4-inches	Quicker ground cover
Seeding rate	1.5 bu/A	Precision planting at 13 seeds/row ft.	Earlier cover and deeper rooting
Nitrogen (N) management*	20 lb/A at seeding, 80 lb/A in late February	20 lb/A at seeding, 40 lb/A in late February; tissue test in April and apply 0 to 70 lb/A based on test	Increases N efficiency; increases growth and crop residue
Tramlines	None	Establish tramlines at seeding (no seed in wheel tracks)	Apply N and other inputs with precision

*Where animal manure or sewage sludge is available, Virginia Tech recommends that the material be analysed. Calibrate the rate and adjust fertilizer applications to account for this N, incorporate whenever possible, and tissue test for additional N needs as indicated above.

Note: BMPs already used in current practice are: rotations; soil testing and application of recommended nutrients; band application of phosphorus; planting at recommended date; certified seed; and scouting for threshold levels of weeds, diseases and insects.

(see other side)

Results and Summary:

For this above-average farmer in Virginia, adopting more BMPs as shown above increases his wheat yield potential from 50 bu/A to 80 bu/A. Research and demonstrations conducted by scientists at Virginia Tech have developed this technology. Some of the innovative farmers in the state are adopting these BMPs with great success. At the same time, the farmer would have the flexibility to release acreage most environmentally sensitive (see map on the other side) and maintain current total production potential. It would also provide flexibility to increase total production when demand warrants. The implementation of BMPs also increases nutrient efficiency, water use efficiency, and reduces soil erosion potential. The table below summarizes some of these production, environmental and economic advantages of a BMP Program.

Approximate Effects of BMPs on Yield *

Variety	5 to 7 bu/A
Row spacing	5 to 10 bu/A
Seeding rate	3 bu/A
Nitrogen management	8 to 10 bu/A
Tramlines	unknown

*Estimated yield increases are not necessarily additive. Interaction effects with other inputs can change the response. The responses shown are averages from various research trials where these inputs were investigated.

Possible Advantages of BMP Program for Soft Red Winter Wheat Production in Virginia

Factor	Current Practice	Recommended BMPs
Expected yield, bu/A	50	80
Acre release potential from 100 acres to maintain same production	—	37
Total production		
with 100 acres, bushels	5,000	—
with 63 acres, bushels	—	5,040
N rate, lb/A	100	130
N efficiency, bu/lb	.50	.62
N removed in the grain, lb/A	60	90
N remaining (most in residue), lb/A	40	34
Total N applied ,lb	10,000 (100 acres)	8,190 (63 acres)
Total N remaining (most in residue),lb	4,000 (100 acres)	2,142 (63 acres)
Production costs, $/A	160	207
Production costs, $/bu	3.20	2.59
Production costs for field		
100 acres, $	16,000	—
63 acres, $	—	13,041
Profit, $/field 100 acres	2,750	—
63 acres	—	5,859

NOTE: BMP adoption allows this farmer to release land with highest degree of sensitivity to environmental factors (designations A, B, and C in this case, see map on other side) and maintain, or improve, total farm production.

Basis for calculations:
Virginia Tech Extension Service ; $3.75 per bushel for the price of soft red winter wheat.

Prepared by agronomists of the Potash & Phosphate Institute (PPI), based on research and extension demonstration information from Virginia Tech.

Senator **Fowler**. Thank you, Dr. Darst, very much.

We welcome Ms. Teresa Maurer. Is that correct?

Dr. **Maurer**. Yes. It is Dr. Teresa Maurer.

Senator **Fowler**. Dr. Teresa Maurer—thank you—coprogram director and research coordinator at the Kerr Center in Poteau——

Dr. **Maurer**. Poteau.

Senator **Fowler** [continuing]. Poteau, Oklahoma. How big a place is Poteau?

Dr. **Maurer**. 8,000.

Senator **Fowler**. That's big. I will remember Poteau. Welcome.

STATEMENT OF TERESA A. MAURER, ASSOCIATE PROGRAM DIRECTOR AND RESEARCH COORDINATOR, KERR CENTER FOR SUSTAINABLE AGRICULTURE, POTEAU, OK

Dr. **Maurer**. Thank you.

A GRIM STATISTIC

I would like to start by pointing out, with millions of farms and their experiences lost since 1940, we may conceivably have lost millions of pieces of agricultural and cultural information and biological understanding that might have been explored and used to benefit neighbors, communities, and society. There are further thoughts on this in my prepared testimony, but I guess one of the points I want to make is, I am not sure sometimes as a scientist that we will ever be able to catch up with that loss.

SEARCHING FOR COMPONENTS AND PRACTICES THAT FIT TOGETHER AND ENHANCE EACH OTHER WHILE PROMOTING STEWARDSHIP AND HEALTH OF LAND

But how can we compensate for them, at least, and what needs have we noted in our region that bring us here today? I should first of all mention that the Kerr Center is a private, nonprofit organization which employs staff with diverse practical and technical backgrounds to study, demonstrate, and educate about sustainable farming systems. On our two working farms and a ranch in southeastern Oklahoma, we are searching for components and practices that fit together and enhance each other, while promoting stewardship and health of the land and the people which it supports. We ourselves are building upon more than 20 years of helping farmers, making a transition ourselves, and our activities address a number of activities that have already been mentioned this morning. Some things that have not been mentioned:

MAKING A TRANSITION AND OUR ACTIVITIES ADDRESS THESE OBSTACLES AND NEEDS

We address energy use and conservation; the use and understanding of biological diversity within our agricultural systems; better definition and understanding of systems and especially the principles that make them work; use of plant and animal adaptation to local conditions and to possible future climatic changes; developing economic and accounting systems which include nonmonetary benefits; and especially looking at resource-sensitive evaluation of technology to ensure responsiveness to local capital, labor, time, and resource limitations.

SELLING OUR PRODUCTS

Products from our work are presently sold through standard markets or directly to consumers, so we do have a direct interaction with the marketplace in addition to our research and education interests.

SURVEY IN OUR REGION TO HELP IDENTIFY NEEDS AND INTEREST

We have received hundreds of responses to a brief survey we recently conducted. I was only able to total a fraction of the over 1,000 replies we received before arriving here, but these represent 102 communities in 44 counties. Most respondents have been farming for 10 years or more, raise livestock, farm more than half time, and most own the land they farm. Only 7 of the 184 responses tallied so far indicated no interest in environmental issues. Nearly all were concerned about water pollution and soil erosion. Most were interested in farming methods which substitute skilled management for purchased inputs. Concern about potential labor requirements for these methods was low, compared to the need for profitability and practicality. The need for better and more research information was apparent, especially integrated information. Over 67 percent were interested in having their land used for on-farm research. The top three topics nominated were livestock grazing systems, fertilization practices, and alternative pest and weed management.

Our own approaches to these topics include: diversifying livestock use on pastures to help control weeds; searching for forages adapted to native soil conditions; identifying legumes that provide fertility and do well in mixtures and with controlled grazing; determining which improved forages—which are usually developed under optimal conditions—can perform well in low or no input conditions; defining and testing grazing systems and decisionmaking models that suit our climate and that consider ecological systems as part of the production system; and, finally, determining the feasibility of alternative products, better grazing management, and insect traps for control of livestock parasites.

IN OUR WORK WE BENEFIT FROM COOPERATION AND COORDINATING ACTIVITIES WITH OTHER INSTITUTIONS

We can't do this alone. In our work we benefit from cooperation and coordinating activities with other institutions. However, there are barriers which hamper such collaboration. These topics by nature require long-term studies and funding to judge ultimate success for research, as well as trials within working systems. Changes in soils and plants, and in livestock health and management needs may take years to become evident. Integration of biological, social, and economic components is necessary to examine assumptions underlying our current practices, as well as to pursue some of the questions about environmental effects already mentioned. While the National Science Foundation has begun to fund interdisciplinary, long-term ecological research, there is little commitment to such approaches by agricultural research institutions. Also, the search for new plant and animal components that would fit well into low-input sustainable systems has been seriously hurt by lack of funding. There also appear to be few institutional awards for collaboration with organizations like ours, or even for collaboration across departments within agricultural institutions. Also, few nonagricultural scientists have the opportunity to become involved in the agricultural research and review process.

ENCOURAGEMENT OF FARMER PARTICIPATION IN RESEARCH

In my last comments I would like to turn to the encouragement of farmer participation in research. Dixon Hubbard in a 1984 Winrock conference report said that "Although sharing information and contacts is their main purpose, networks can go beyond mere transfer of data to actual creation and exchange of knowledge." I go on to point out some of the networking that has occurred as a result of some of the LISA funding. I feel that ultimately networks may provide stronger, faster, more responsive communication than current one-directional linkages. Farmer involvement from the beginning should speed adoption of successful practices.

Then I end up by saying that farmer participation in our region is limited by distance from institutions and financial and labor constraints to spending time away from the farm. There was a farmer-to-farmer assistance program developed in our region, and also some LISA funding available, but the three current projects are underfunded and relatively few farmers in the area can participate in research without some sort of compensation.

CONCLUSION

I hope future agricultural policy can address both the problems and the promise of the work outlined here today. Thank you.

[The prepared statement of Dr. Maurer follows:]

STATEMENT OF TERESA A. MAURER, ASSOCIATE PROGRAM DIRECTOR AND RESEARCH COORDINATOR, KERR CENTER FOR SUSTAINABLE AGRICULTURE

Senator Fowler and members of the Committee, I appreciate this opportunity to present testimony on the search for economically, environmentally and socially sound agricultural practices.

I would like to begin by juxtaposing a grim statistic with several sentences that have haunted me since I read them several months ago. The statistic: since 1940, over 4 million U.S. farms have disappeared. The sentences read: " The loss of cultural information due to the depopulation of our rural areas is far greater than all the information accumulated by science and technology in the same period. Farm families who planted, tended, harvested and stored the produce of the agricultural landscape gathered information, much of it unconsciously, from the time they were infants. In the farm household, in the farm community and in the barns and fields...they learned basic lessons of agronomy. " (excerpted from Dr. Wes Jackson's recent essay on "The Information Implosion").

These thoughts could be considered together with a very conservative estimate of at least 1 unique idea or practice for land stewardship for every 4 farms. We may conceivably have lost over 1 million pieces of agricultural information and biological understanding that might have been explored and used to benefit neighbors, communities and society. It is also likely that fewer farms may mean that fewer agricultural researchers will approach their work with experience and cultural knowledge directly from the farm or from rural communities.

Our society's narrowed experience may be an unrecognized obstacle in its search for environmentally and socially sound agricultural methods. To compensate for this, future farming success may depend upon our willingness to nurture and reward good ideas and land stewardship practices (rather than a sole emphasis on maximum production) from remaining farmers and farms. Simultaneously, we must be willing to reward and encourage agricultural researchers who form working partnerships with farmers and educators to discover the working principles behind these practices. Likewise, those who cross disciplinary and cultural lines to expand the boundaries of conventional agricultural research should be encouraged, because they replenish and renew our idea base, and allow fuller examination of the social and economic consequences of adopting particular practices. Also, agriculture should be taught as a dynamic, relevant subject which can integrate our science curricula. It should be considered as vital to our children's education as an understanding of human biology and ecological science. Most future citizens and consumers will influence markets, policy, research and production without farm-based experience.

What needs have we noted in our region that support the above general recommendations and bring us here today? I should first mention that the Kerr Center is a private, non-profit organization which employs staff with diverse practical and technical backgrounds to study, demonstrate and educate about sustainable farming systems. On our working farms and ranch in southeastern Oklahoma, we are searching for components and practices that fit together and enhance each other while promoting stewardship and health of land and the people which it supports. We ourselves are making a transition and our activities address these obstacles and needs:

1. fertility management and soil health
2. insect, disease and weed management
3. energy use and conservation
4. use and understanding of biological diversity
5. water management
6. utilization of waste materials
7. better definition and understanding of systems and inteactions
8. plant and animal adaptation to local conditions
9. economic/accounting systems development to include non-monetary benefits
10. resource-sensitive evaluation of technology to insure responsiveness to local capital, labor, time and resource limitations

Products from our work are presently sold through standard markets or directly to consumers, so that we do have direct interaction with the agricultural marketplace in addition to our research and education interests.

In the past few weeks we have been receiving hundreds of responses to a brief survey we conducted in our region to help identify needs and interests. I was able to tally only 184 of the over 1,000 replies before arriving here, but these replies reflect respondents from 102 communities in 44 counties. Most respondents tallied to date have been farming for 20 years or more, with the next largest group farming 10-20 years. A majority raise livestock and farm more than half time, and most own the land they farm. Only 7 of 184 people responded they had no interest in environmental issues, with most people indicating concern about water pollution and soil erosion. Most respondents indicated an interest in farming methods which substitute skilled management for purchased inputs. Concern about potential labor requirements for these methods was low compared to the need for profitability and practicality. The need for better and more research information was apparent from responses to 3 different questions, and over 67% were interested in having their land used for on-farm research. The top 3 topics nominated were livestock grazing systems, fertilization practices and alternative pest and weed management.

Our approaches to these topics include:

- diversifying livestock use on pastures to help control weeds
- searching for forages adapted to native soil conditions
- identifying legumes that provide fertility and do well in mixtures and with controlled grazing
- determining which improved forages (usually developed under optimal conditions) perform well in low or no input conditions
- defining and testing grazing systems and decision-making models that suit our climate and consider ecological systems as part of the production system
- determining the feasibility of alternative products, better grazing management and insect traps for control of livestock parasites

Our work would benefit from cooperation and coordinating activities with other institutions. However, there are barriers which hamper such collaboration. These topics by nature require long term studies and funding to judge ultimate success for both research as well as trials within working systems. Changes in soils and plants, and in livestock health and management may take years to become evident. Integration of both biological and economic components is also necessary, especially to examine the assumptions underlying our current agricultural practices and to pursue the questions raised by increaing public concern about the environmental effects of agricultural practices. While the National Science Foundation has begun to fund interdisciplinary, long term ecological research, there is little committment to such approaches by agricultural research institutions. Also, the search for new plant and animal components that would fit well into low input sustainable systems has been seriously hurt by lack of funding for new crops or animal breeds that would increase biological and economic diversity in agricultural systems. Likewise, there appear to be few institutional rewards for collaboration with organizations like ours, or even for collaboration across departments within agricultural institutions. Few non-agricultural scientists have the opportunity to become involved in the agricultural research and review process.

For my last comments I would like to turn to the topic of encouraging farmer participation in research and extension. Dixon Hubbard in a 1984 Winrock conference report noted the advantages and growth of networking among livestock producers. He noted, "Although sharing information and contacts is their main purpose, networks can go beyond mere transfer of data to the creation and exchange of knowledge". In Oklahoma, I have participated in informal "management clubs" in which small groups of farmers and ranchers gather periodically to exchange ideas. I always come away with more research questions than I could answer in a lifetime. Elsewhere in our region, funding from recent legislation made it possible to begin to solidify and activate a network of farmers, extensionists, educators and researchers from over 20 organizations in 3 states. Publication of research and information on sustainable agriculture often lags well behind actual work or is not widely available, so the network has been a critical link in regional communication between farmers and researchers. Ultimately networks here and elsewhere may offer a stronger, faster, more responsive communication than more linear and one-directional linkages from researcher to extensionist to farmer.

Farmer participation in research in this region is limited by distance from institutions and financial and labor constraints to spending time away from the farm. Lack of funding for trying new practices spurred the formation and funding of a farmer to farmer technical assistance project by the Ozark Small Farm Viability Project using oil overcharge monies. Very limited assistance and compensation for farmer time spent on research is also available through two LISA-funded projects in the region. However, all 3 projects are underfunded, so that relatively few farmers in the area can participate.

I hope that future agricultural policy will address some of the problems as well as the promise of the work outlined here today.

Senator **Fowler**. Thank you, Dr. Maurer. I also offer you the Billy Graham award for most words and thoughts per minute. [Laughter.]

Dr. **Maurer**. If I was talking like this back in Poteau, they would tell me they couldn't understand me.

Senator **Fowler**. Senator Bond, would you like to have some questions first?

Senator **Bond**. Thank you, Mr. Chairman.

I was interested in the work of Dr. Darst's foundation. I might ask, with all the grants you have given out, have you drawn any broad conclusions from the results of the efforts that you have put in that might be useful to us in considering legislation or developing policy in this area?

Mr. **Darst**. Well, as a broad overview, Senator, one of the conclusions that we have drawn and I think has been evolving through scientific research for years and years, is the fact that many new practices that we do discover through technology are very, very site-specific, and can't be applied generally but must be applied very carefully to maybe a particular area. Specifically, yes. One of the things is nitrogen management, for example. In terms of ground water protection, we know that nitrogen has potential to contaminate.

The research has included timing of nitrogen, to place it when the crop needs it; splitting applications so that you can feed the crop and not leave nitrogen in the soil for potential leaching; products that stabilize nitrogen and hold it in a form that does not leach until the crop can use it. Those are some very specific new technologies that have been developed and that our industry, the fertilizer industry itself, now utilizes in new nitrogen products that are coming out and being placed on the market.

Now I must point out that in a presentation in Budapest a couple or 3 weeks ago, one of our industry leaders acknowledged the fact that these new technologies and the applications of these new technologies would probably reduce the demand for nitrogen. It would require less per unit of crop production.

That is a very specific example. I can give you others in other areas, for example in residue management and that sort of thing, if you would like for me to follow up on that.

Senator **Bond**. What I was wondering is, as we are developing policy, you are pointing out that we are getting better at applying chemicals. We used to apply them in pounds per acre. We are now down to ounces per acre.

Mr. **Darst**. Right.

Senator **Bond**. Do you feel that there is more, that we will continue to move in this direction so that we can utilize whatever chemicals we need even with less expense to the farmer and less harm to the environment? Do you see this as a——

Mr. **Darst**. I think that is one option but I would point out, too, that there are cases where we may have to apply more chemicals. For example, it has been mentioned here, Senator Fowler mentioned the need to maintain fertility. Some of our soils are very low in fertility, unfortunately. Some of our Georgia soils are very low in fertility.

Senator **Bond**. I thought that red was supposed to make them productive. It doesn't, apparently.

Mr. **Darst**. They don't need that much iron, actually, but yes, the key is balancing inputs. I find it interesting that as we talk about low input, several years ago a young extension agronomist over at the University of Arkansas proposed a program of cutting back on chemicals per acre, and he has done some very good work there, but the real key to the success of that program to date has been the fact that producer management has been the underriding issue.

Timeliness is the key. If the producer is not willing to be in his fields the day he is supposed to be in his fields, if he is not willing to do the work when it is supposed to be done, then reduced inputs or even optimum inputs will not offer the kind of results that we have to have.

Senator **Bond**. I would like to ask Dr. Maurer—and it may have been in the testimony, I may have missed it—you talked about involving a number of farmers in your projects. Number one, you said I think in your testimony that 7 out of 184 were not interested in the environment. Frankly, I think that is very high. I don't know any good farmers who are not interested in the environment, and I am surprised that you had seven who said they were not interested.

Have you worked with farmers who were not provided outside assistance through research or grants or the mechanisms of your organization, who are making a profit on low-input sustainable agriculture? What kind of income can a farmer who depends solely on farming in southeast Oklahoma make with sustainable agriculture, what kind of net income? You mentioned the fact that they get nonmonetary availability of food for the family that is very important, and other resources. Do you have any figures on that?

Dr. **Maurer**. We have only emphasized sustainable agriculture for about 3 years, our previous work was more conventionally based, so we are fairly new, but I think one of the things that we are looking at are ways of examining if livestock production, for example, has some more inherently sustainable characteristics. I think farmers in our area are becoming more aware of other options, probably looking more at a diversified economic base or a diversified livestock base, those kinds of things. So I guess we haven't identified people just yet that are specifically doing sustainable agriculture. We are trying to define what sustainable agriculture is for our region, so I am not sure as yet that I could give you a figure for income from specifically sustainable farms.

Senator **Bond**. OK, but that would be primarily in livestock, not what we would consider the program crops.

Dr. **Maurer**. Yes, right. Right. There are relatively few of those in our area.

Senator **Bond**. Let me ask you this, Ms. Krome, and perhaps Dr. Laughlin also would want to comment on it: Are you suggesting that we use less chemicals and more labor? Is this the direction you feel we should go?

Ms. **Krome**. Yes. In answer to your question, I guess I will restate it slightly, and that is yes, I think that one of the big concerns is to reduce chemicals. I think a lot of farmers that we work with would say it isn't so much more labor-intensive. It is, as Dr. Darst said, more management-intensive. You have to think more, and some of the farmers that we work with think that's better. I mean, they refer to the other as "label farming" or "bottle farming." It's more fun. It's more interesting. There are a lot more creative opportunities. You have much more control over what is going on on your land, and so that requires a lot more thought, not necessarily more labor.

I think all of the farmers who are interested in this—and I think there are, as you said, a great many, probably the majority who are interested in reducing their chemicals but don't know how—are anxious to reduce their chemicals. Some of them will probably have to increase their labor; some won't. I think they will all have to increase their management.

Senator BOND. Have you seen enough examples on their productivity to know whether they can be profitable? We are competing in a world market, and in some crops we have comparative advantages now; in other crops we don't. Do you see us being able, with low-input sustainable agriculture, being able to continue our share of the world market and be price-competitive? Is that consistent?

Ms. KROME. I certainly do, if the example of the farmers that I know and work with in Wisconsin are——

Senator BOND. What are their primary crops?

Ms. KROME. Wisconsin is famous as a dairy State. There are other livestock operations, hogs and beef, but there is cash grain as well in the southern part. I was at a farm last week that is a very large cash grain farm in Wisconsin, by Wisconsin standards, about 1,000 acres, and very profitable. In fact, he reduced his chemicals in order to be profitable. His production is fine, and he is extremely satisfied with his own net return.

Senator BOND. It is just better management. He is not getting rid of them. He is using them——

Ms. KROME. That is in his case. There are farmers, of course, who fall anyplace in the spectrum, but he has reduced his chemicals significantly and he has found that it has increased—he did it intentionally. He is a very environmentally concerned fellow but he is real practical and looks at the bottom line. That is what is driving his decisions.

Senator BOND. What are his crops?

Ms. KROME. Corn and soybeans.

Senator BOND. Does he use integrated pest management or——

Ms. KROME. I guess I am reluctant to use the term because it means so many different things to different people. Yes, he is very careful. Insects aren't the big issue there. Weeds are really the big concern, and he uses several techniques. He does band his herbicides, but he also uses some allelopathic effects from growing rye, for example, and that has an effect. He uses ridge tillage.

There are several mechanisms, approaches that you can use, and I think in the dairy area there are a lot of farmers across the State who found that by careful, sensible use of their legume crops and their manure, they are able to provide the nitrogen they need. They just don't buy nitrogen. They are able to do a really good job of keeping their production up and keeping their—I was on a farm

2 days ago where the fellow is just very satisfied with his net return.

Senator **Bond**. Now I would ask Dr. Laughlin the same general question. Do you see us being able to remain competitive in the world market for the major commodities with low-input sustainable agriculture? To what extent will we be forced by the economies of the world market and the competition from abroad to continue to rely on chemical inputs to agriculture?

Mr. **Laughlin**. First, as a noneconomist and as a biological scientist, I will have to couch my answer in that realm.

When you are talking about sustainable systems, if a system is not profitable, it is not sustainable. Secondly, in addition to the management inputs, the whole realm of biotechnology of new opportunities for sustainable agriculture. Biotechnology is not just manipulation of genes, but it is a whole bag of tools that are available for the manipulation of cellular and molecular structures. Many of the genes which we hope we can identify are unknown entities. I think it is important to recognize that the identification of a specific gene is in the future but the identification of the promoter genes and the regulatory genes in plant materials are way behind those in the animal system, based upon the support for medical research. When you add these into a system, these will have enhanced pest tolerance or resistance. You will have plants capable to be grown under environmentally limiting situations.

Then I don't think you are looking at increased labor. You are looking at an understanding of the biological systems, and the coupling of this information to management is necessary. I think that Dr. Darst made a very good point, that with management it becomes a timing factor. You can't postpone what you are going to do when it needs to be done.

Now I think there has to be some flexibility in programs. This year in southeastern Georgia there was an organism which invaded soybeans and cotton called the beet army worm—had nothing to do with Navy—but it came and was devastating. It cycles in about every 7 to 10 years, and you don't know when it is going to come. If there had not been an arsenal to draw upon to find the best strategy, then those two crops would have been completely lost in that part of the State.

Senator **Bond**. What kind of arsenal are you talking about?

Mr. **Laughlin**. They had to draw upon what was available in the area of pesticides, insecticides particularly. They looked for available biologicals. This ties in the area of biotechnology including the enhancing of naturally occurring virus parasites of insect larvae with different kinds of toxins.

Senator **Bond**. Thank you, Mr. Chairman.

Senator **Fowler**. I will say immodestly, the real army they drew upon was their very fine U.S. Senator, who got the money for them. [Laughter.]

You can strike that from the record.

Senator **Bond**. We're talking agriculture. There's no reason we can't talk pork, too.

Senator **Fowler**. Thank you, Senator Bond, and all the participants. I do have some questions of my own, but in the interest of time we just can't do it.

Dr. Laughlin, I do want to say to you from our fellow States, in listening very carefully to your fine testimony, that nothing that has been proposed in the Congress, I would submit, is revolutionary. I think your words were, we need an evolution toward this, not a revolution.

Now Mr. Goldsmith is proposing a revolution. He says that modern agricultural practices, designed to feed people and especially to feel starving people, have had the opposite effect. That view deserves to be explored. If we are building big dam projects and taking away people's land, and therefore they can't feed themselves any more, that deserves attention and examination.

But there is nothing that anybody in the Senate is doing that can be remotely described as revolutionary in the way that Dr. Darth said. We are trying to get farmers to—with professional advice, with the research that is already available, much of it described also by Dr. Hess—to ask questions, to use their heads, as Ms. Krome said, to ask questions whether or not they can save a lot of money and still get sufficient yields and make a profit, but also by using less chemicals and fertilizers.

We have seen, both with our visiting the farms—the committee—and also hearing the testimony of all of you today, some remarkable achievements, very surprising to the producers, where some of all this research that we have been funding at the State and Federal level—many people would say not enough, including me—but the money we have put in has produced some surprising results. Of course it hasn't just come from public moneys, but private industry sources also.

But we need your help, because we still have some people who are in public policy positions of authority and influence, who have not quite looked away from the old ways of doing things but who are still, like the community doctor, always sought as the ultimate authority. I get in trouble with the doctors all the time, the medical doctors, because doctors are the only people that I know who get total authority, total respect, godlike powers, the second they graduate from medical school. You can go to that doctor the first day, and he can tell you to do something, you are going to do it because you trust him.

Well, our extension people in many cases are in that position, but we need their help in looking at what we are trying to do, because we are all moving in the same direction, not only the consumer but especially the farmer, because his livelihood is what we are trying to enhance, to help him continue to compete and to produce in a way that will be sustainable in the short run for his family but more importantly in the long run.

Thank you all very much for being here.

Ms. **Krome**. Senator, may I make one request?

Senator **Fowler**. Please.

Ms. **Krome**. I neglected, as I realized as I made my testimony, to say that we very much support your section 402 of the Fowler bill, and would have a few suggestions that may be helpful to you in further developing that section.

Senator **Fowler**. Please, please.

Ms. **Krome**. I did not include them. I would like to have them attached to my testimony, if you would be willing to make sure that they are incorporated into the record as well.[1]

Senator **Fowler**. I will certainly do that.

Ms. **Krome**. Thank you very much.

Senator **Fowler**. Thank you.

Ladies and gentlemen, if I can have your attention for a moment, we have to make a slight adjustment here which those of you, especially in Washington, will understand. We have three more panels with three or four people on each panel that we want to hear from, and we want to spend as much time with you as possible, but Senator Bond and all of us are going to start voting at noon on a child care bill. We have at least two votes and we may have three or four, so we are not going to be able to finish and hear from you the way we would like to hear from you by 12.

May I suggest that we come back? We are going to continue now until 12, and take panel 2 certainly, hopefully 2 and 3, but to Mr. Bob Beck, Dr. Jack Early, Mr. Jake Redmon, I have to ask you to come back at 2 o'clock, which means also if you want to leave now and do other of your business, you can. We won't get to you before 2 o'clock.

Anybody else on these other two panels where it would be more convenient for you to be dismissed now until 2 o'clock, we can take as many as five or six at 2. Otherwise, Mr. Beck, Dr. Early, Mr. Redmon, and anybody else that would be more comfortable or more convenient at 2 o'clock. Otherwise we will have the next two panels. I think we can do that between now and noon.

Mr. James Lee Adams, the president of the American Soybean Association, please come up; Mr. Donn Klor, Mr. Dean Kleckner, Mr. Dallas Tonsager.

Welcome, gentlemen. We will begin with Mr. James Lee Adams, the national president of the American Soybean Association, but with pleasure from the great town of Camilla, Georgia.

STATEMENT OF JAMES LEE ADAMS, JR., PRESIDENT, AMERICAN SOYBEAN ASSOCIATION, CAMILLA, GA

Mr. **Adams**. Thank you, Senator.

INTRODUCTION

I appreciate the opportunity to testify on behalf of the American Soybean Association. I am also testifying today on behalf of the National Association of Wheat Growers, the National Corn Growers Association, the National Cotton Council, and the U.S. Rice Producers Legislative Group. I thank you very much for the opportunity to be here, and it is a real pleasure. We appreciate your leadership and Senator Bond's leadership on this issue. It is absolutely critical.

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[1] See pages 50 to 51 for a proposed substitute for section 402 of S. 970 submitted by Ms. Krome.

HISTORY

We saw a watershed difference in this 1985 farm bill, and I think everybody has been focusing on the fact. There were some changes as far as our market posture, external, going outside, but equally significant to us is the fact that from the historical point of view, for the first time the conservation title was in that legislation.

It is our responsibility as agricultural leaders to look toward the 1990 farm bill and discuss policies designed to enhance our current conservation and environmental laws. Environmental challenges are a priority for farmers. We were talking about it earlier, about the turbulence. I think that is just something that has been in agriculture for so many years, but since we farmers' livelihood depends upon maintaining environmental quality, we are working to enhance our stewardship of natural resources and the environment. In the 101st Congress, soybean farmers and their counterparts producing wheat, corn, cotton, and rice seek balanced environmental policies which allow them to produce these commodities competitively and profitably while protecting the environment we live in.

LISA

LISA has become a new Washington buzz word. LISA stands for low-input sustainable agriculture. It appears that LISA is having the same problem the term "decoupling" had; everyone has a different definition for LISA and the basis for support or opposition depends on the individual's definition.

We believe that U.S. farmers are currently using low-input practices as related to the information they have today. The economics tell farmers to use the least amount of inputs possible for an adequate return. This has not always been the case. Ten years ago the perception of some producers was if 1 pound per acre worked, then 2 pounds was better. For example, in the past in the State of Georgia, I know, Roundup herbicide had been used at the recommended application rates, upwards of 3 quarts per acre. Presently I am, on my farm, using rates as low as 4 ounces per acre of this material. They are particularly recommending rates as low as 1 quart per acre.

ASA has just completed a major survey of farm attitudes on the issue of LISA versus current low-input practices. We will be glad to share the results with the subcommittee as soon as they are tabulated.

Senator **Fowler**. Good.

FARMERS ARE USING BETTER AND MORE SPECIFIC APPLICATION METHODS

Mr. **Adams**. Additionally, farmers are using better and more specific application methods which also reduce the total amount of chemicals used. In fact, most farmers participate in integrated pest management programs, and in many cases consult with integrated pest management specialists who inspect their crops and advise them on the most practical approaches to pest management, and I think we in Georgia have been really at the forefront of that. I know on my farm we are using it on every single crop except corn, where it is not really applicable there, but even there we are doing tissue testing and soil testing every week or two to make sure that we are maintaining the proper fertilizer levels without overfertilizing.

Corn farmers are increasingly turning away from preemptive use of pesticides, employing them only after crop scouting reveals a need. The potential to improve pesticide application technology for reducing environmental impact is great, and we support expanding research to develop and refine this technology.

My point is that low-input practices need not be regulated by government action. Economics and farmer concern for our own natural resources have already started moving farmers in the direction of low-input practices.

DEFINITION OF LISA PERTAINING TO THE USE OF CHEMICALS

Some suggest that the LISA should be defined in such a manner as to encourage the eventual elimination of all chemical use in agricultural production practice. This definition would be off-base, and we would oppose such efforts. We saw what happened last year, what Chuck was talking about in Georgia, also with the spider mites that broke out in Iowa. We would have lost that soybean crop almost entirely across that State if we did not have pesticides.

This year I was talking to my father, and sometimes you get real good insight from hindsight. He said with the rains we have had down there in Georgia this year, this spring, that literally we would have lost our entire crops if we had not had herbicides available to protect those crops from weeds and grasses during this rainy spell, so I think there are appropriate times that you are absolutely going to have to have some of these fallback chemicals.

As both users of chemicals and consumers of products which have been produced with the assistance of chemicals, our members have an appreciation for the great contribution these chemicals make to our food and fiber supply. The benefits of chemicals to consumers and to the food and fiber supply, the essential reason for using them at all, are often overlooked. Yes, agricultural practices which involve the use of chemicals can be given a great deal of credit for helping provide a safe, economical, and abundant food supply to the American public. Disease and insects cannot be adequately controlled by crop rotation or organic farming at all times.

Organic farming is a positive part of the agricultural sector, but total organic farming would not be successful, in our opinion. The results would be crisis outbreaks of disease and insect infestation which would require greater than normal application of chemicals and threaten the U.S. food supply. In most cases organic farmers are surrounded by farmers who use chemicals to control disease and insects. Therefore, crisis outbreaks are controlled and the organic farmer benefits from his or her neighbor's production management.

IN ORDER TO PROMOTE A LISA PROGRAM WITH CHEMICAL-FREE PRODUCTION AS THE ULTIMATE GOAL, CONGRESS WOULD NEED TO BUDGET FEDERAL FUNDS TO MAKE LISA PRACTICES VIABLE AND POTENTIALLY PROFITABLE

In order to promote a LISA program with chemical-free production as the ultimate goal, Congress would need to budget Federal funds to make LISA practices viable and potentially profitable. This may be particularly true while the practices and concepts involved with LISA are in transition. ASA is concerned that tight spending policies would cause other programs to suffer financially in order to provide the moneys needed, particularly those research programs which could move us in this evolutionary phase toward it.

WE FAVOR A BROAD-BASED, WELL-FUNDED PROGRAM OF BASIC AND APPLIED RESEARCH

In order to reduce inputs of plant nutrients and plant protection chemicals while maintaining profitability, further production research is needed. We favor a broad-based, well-funded program of basic and applied research. Examples of past successes in integrated pest management research include the boll weevil eradication program, which has helped reduce pesticide use on cotton in North Carolina and South Carolina from 50 to 70 percent and is working well now in Georgia. Sterile pink bollworms released on cotton in California have reduced pesticide use for some growers by 75 percent. Research is the key to this low input.

NEW GENETIC ENGINEERING APPROACHES TO SOLVING AGRICULTURAL PROBLEMS ARE BECOMING A REALITY

Additionally, new genetic engineering approaches to solving agricultural problems are becoming a reality. In Georgia the farmers, through a check-off program, have been funding development of soybean varieties which are resistant to insects, and we will be releasing these over the next year or two. In fact, I was told the other day by scientists at the university that they suspect that with a good breeding program and some other application technique changes, we could eliminate 95 percent of the pesticide use in Georgia over a period of time, with the right type of research.

[The prepared statement of Mr. Adams follows:]

TESTIMONY OF THE AMERICAN SOYBEAN ASSOCIATION
PRESENTED BY PRESIDENT JAMES LEE ADAMS, JR. BEFORE THE
SENATE AGRICULTURE, NUTRITION AND FORESTRY SUBCOMMITTEE ON
CONSERVATION AND FORESTRY
UNITED STATES SENATE
JUNE 22, 1989

re: AGRICULTURAL AND CONSERVATION PRACTICES

Thank you Mr. Chairman and good morning. I am James Lee Adams, a soybean farmer from Camilla, Georgia. In addition to producing 500 acres of soybeans, I raise pecans, peanuts, wheat, corn, sunflowers, grain sorghum, rye, and oats. I'm here today as President of the American Soybean Association (ASA). ASA is a national non-profit organization representing U.S. soybean farmers with members in 29 states. ASA seeks to increase the opportunity for U.S. farmer profitability through its market development, research, government relations and trade policy programs.

It is a pleasure to appear before the Senate Agriculture, Nutrition and Forestry Subcommittee on Conservation and Forestry to discuss conventional and alternative agricultural and conservation practices as they relate to production agriculture. I'm testifying today not only on behalf of ASA but also for the National Association of Wheat Growers, the National Corn Growers Association, the National Cotton Council, and the U.S. Rice Producers Legislative Group.

As your constituent Mr. Chairman, I appreciate the leadership you have shown in this area and commend you and the Subcommittee for holding this first in a series of hearings which will hopefully establish the framework for the Conservation Title of the 1990 Farm Bill.

HISTORY & INTRODUCTION

Passage of the Food Security Act of 1985 opened the door for a new era in agriculture. Most often we hear how the 1985 Farm Bill helped to reestablish our position in the world market by enhancing export market competitiveness. But equally important was the Conservation Title which included historic legislation. Congress passed a 40 to 45 million acre Conservation Reserve Program (CRP) to remove highly erodible land from production in return for rental payments from USDA. Sodbuster and swampbuster provisions were included to help protect that land at the conclusion of the 10 year contracts and other marginal land and wetlands. Finally, the 1985 Farm Bill established a time frame in which all farm commodity program participants must establish a conservation compliance program for their farm. I will not address the minor modifications needed to these generally sound programs since a future hearing in this Subcommittee is scheduled to discuss such changes.

Now it's our responsibility as agricultural leaders to look toward the 1990 Farm Bill and discuss policies designed to enhance our current conservation and environmental laws. Environmental challenges are a priority for soybean farmers as well as the vast majority of farmers involved in production agriculture. Since their livelihood depends upon maintaining environmental quality, they are working to enhance their stewardship of natural resources and the environment. In the 101st Congress, soybean farmers and their counterparts producing commercial volumes of wheat, corn, cotton, and rice seek balanced environmental policies which allow them to produce soybeans and other commodities competitively and profitably while protecting the environment.

Policy challenges ahead include groundwater protection, pesticide regulation, endangered species protection, pesticide emissions, farm worker protection, pesticide container disposal, and farmer liability in cases of environmental degradation when chemicals are used according to label instructions. Each of these topics deserve their own forum and I will not address them in detail today. Hearings have been held on the pesticide regulation/food safety issue by the Senate Labor and Human Resources Committee, the new endangered species program has just been released by EPA, the President has announced his clean air proposal, and this Subcommittee will look at the groundwater situation at its broader hearing on water quality next month.

Farm programs are another area which may have an impact on environmental practices. Though these programs will not be dealt with in the Conservation Title of the Farm Bill, the agriculture committee will need to evaluate them. Many believe that the rigid farm commodity programs that exist have discouraged farmers across the country from practicing some sound environmental practices. Farm programs, which have economically discouraged some farmers from a corn/soybean rotation, may be held responsible for some environmental degradation. The planting flexibility question needs to be placed on top of the commodity program agenda from an environmental perspective.

LOW INPUT SUSTAINABLE AGRICULTURE (LISA)

The purpose of today's hearing is to look at the current conservation practices of production agriculture, those which are proposed, and those which need additional research. Several pieces of legislation have been introduced in the 101st Congress looking at these issues. Mr. Chairman, you and the Committee's Ranking Minority Member from Indiana, Senator Lugar, have introduced separate comprehensive bills which provide opportunities for "low input" practices. Additionally, Senator Pryor of Arkansas has introduced the Best Management Practices bill, and Integrated Pest Management is a major topic of discussion. Finally, a number of biotechnology research projects are finding their way through the appropriations process.

LISA has become a new Washington buzz word. LISA stands for "low input sustainable agriculture." It appears that LISA is having the same problem the term "decoupling" had; everyone has a different definition for LISA and the basis for support or opposition depends on the individual's definition.

I believe that U.S. farmers are currently using "low input" practices. Economics tell farmers to use the least amount of inputs possible for an adequate return. This has not always been the case. Ten years ago the perception of some producers was if one pound per acre worked, two pounds might be better. For example, in the past Roundup had been used at a recommended application rates of 2 to 3 quarts per acre. Today farmers are frequently applying Roundup at rates as low as 1 quart per acre. Similarly, in corn, farmers frequently have applied atrazine at a rate of 4 pounds per acre to control grasses. Now, the use of the herbicide Tandem along with atrazine, if necessary after corn emerges, can allow farmers to cut their grass-control herbicide applications by at least 50 percent.

In addition, farmers are using better and more specific application methods which also reduce the total amount of chemicals used. The potential of improved pesticide application technology for reducing environmental impact is great, and we support expanding research to develop and refine such technology. So my point is that "low input" practices need not be regulated by government action. Economics and farmer concern for our natural resources has already moved farmers in the direction of "low input" practices.

Some have suggested that the definition of LISA be agricultural production systems and management strategies, designed for family-sized farms, which optimize the use of on-farm resources and minimize the use of production items and practices with known or potentially adverse impacts on human health and the environment, while maintaining acceptable levels of production and profit from farming. While in theory this reflects how farmers make decisions about what chemicals to use and at what levels, there are problems with regulating such a definition. They include:

1) What size is a "family farm?" Why should "low input" agriculture be limited to "family-size farms" and not be available to larger farms?

2) Before a product is approved by the federal government, numerous tests must be conducted to ensure a safe product for the environment and consumers based on the toxicity of the product, it's potential exposure, and it's potential benefits. ASA and other commodity organizations believe it would be improper to promote changes in production systems which may adversely affect the farmer unless such changes are based on sound scientific facts. "Potentially adverse" effects based

on other than sound scientific evidence should not impact agriculture production systems as the definition suggests.

3) What are "acceptable levels of production and profit?" Does the "acceptable level of production" change as world demand for fiber, feedstuffs, and foodstuffs increases or in years following production shortfalls? Who determines what level of "profit" will be adequate to cover farmers' cost of production in all regions of the country and provide the farmer with a respectable profit?

4) Are consumers prepared to pay the increased cost of food and fiber if either production decreases or if supply is restricted to the point where the marketplace dictates a higher price?

5) If production levels fall and importation of agricultural products increase, what impact will that have on the overall U.S. economy? Does "acceptable levels of production" include the needs of foreign countries, particularly for Third World developing countries who receive food aid from the U.S.?

Still others have suggested that LISA should be defined in such a manner as to encourage the eventual elimination of all chemical use in agricultural production practices. This definition would be off-base and ASA would oppose such efforts.

As both users of chemicals (pesticides, fertilizers, etc.) and consumers of products which have been produced with the assistance of chemicals, our members have an appreciation for the great contribution these chemicals make to our food and fiber supply. The benefits of chemicals to consumers and to the food supply, the essential reasons for using them at all, are often overlooked. Yes, agricultural practices which involve the use of chemicals can be given a great deal of credit for helping provide a safe, economical, and abundant food supply to the American public.

Let me provide an example related by a soybean farmer in Iowa. Last year the soybean crop in the Midwest was infested with spider mites. This was the first time in over 15 years this problem occurred; it was drought induced. It was necessary for Midwestern farmers (including many farmers who farm organically) to spray for spider mites or suffer the loss of the crop.

If the spider mite pesticide had not been available, the Midwest would have suffered a near total loss of the soybean crop. Thus supply would have been reduced, price would have increased, and food processors could have been forced to substitute high saturated fat palm and coconut oils for healthier soybean oil. This would have had an adverse health impact on the American consumer. Also, if soybean oil prices were too high, the use of soybean oil-based printing ink as a substitute for petroleum-based printing ink would have been reduced. The results -- more petroleum-based ink waste, a non-biodegradable product, and less soybean oil-based ink waste, which is biodegradable.

This and other situations show that we do not spray pesticides without recognition of need. In fact, most farmers participate in integrated pest management programs and in many cases consult with professional entomologists (or integrated pest management specialists) who inspect their crops and advise them on the most practical approaches to pest management. For example, corn farmers are increasingly turning away from the preemptive use of pesticides, employing them only after crop scouting reveals a need. Sophisticated formulas are available to help producers determine whether the yield reductions resulting from infestations of European corn borers and corn rootworms actually dictate use of insecticides, helping to eliminate indiscriminate use of the chemicals. In my opinion this integrated pest management approach is a very useful "low input" production practice.

I think it is also important to note some economic disincentives for the consumer and producer to the complete elimination of all pesticides. According to credible industry sources, the U.S. could suffer a 9 to 50 percent decrease in crop production without pesticides. Estimates are that a 9 percent decrease would amount to $8.7 billion worth of lost crops and a 12 percent increase in retail prices. A 50 percent decrease in crop production would result in an increase of 4 or 5 times present retail prices. Studies in Iowa and Illinois showed that chemical weed control saves soybean farmers up to 11.7 percent over the cost of mechanical tillage, and increases yields by 7.9 bushels per acre.

As I have said, agricultural chemicals are currently being used at minimal amounts and many times intermittently. Disease and insects cannot be adequately controlled by crop rotation or organic farming. Organic farming is a positive part of the agricultural sector, but total organic farming would not be successful. The results would be crisis outbreaks of disease and insect infestation which could require greater than normal application of chemicals, and threaten the U.S. food supply. In most cases, organic farmers are surrounded by farmers who use chemicals to control disease and insects. Therefore, crisis outbreaks are controlled and the organic farmer benefits from his/her neighbor's production management.

I think it is interesting to note the thoughts of the Nobel Peace Prize winner Norman Borlaug. I would like to share a part of his works:

> " . . . [T]he agricultural technology of the 1930's, which was adequate to produce food for a world of two billion people, could not produce the food required by five billion. To return to the methods of 50 years ago would be to plunge the

> world into famine and into social, economic, political, and -- yes, environmental chaos.
>
> "The general public, especially the urban part of it, does not understand the complexities and difficulties of producing and protecting our crops, most of which could not be grown at all or would not produce reasonable yields without modern husbandry. This ignorance, unless corrected, poses a serious threat to the food supply of future generations. . . .
>
> "An attempt to turn back the clock invites disaster. For example, if U.S. farmers used the agricultural technology of the 1930's and 1940's to produce the harvest of 1985, they would have to convert 75 percent of the permanent pasturelands in the U.S. or 60 percent of American forests and woodland areas to cropland. . . .
>
> "The point is not that there should be no safeguards to protect the environment and human health from the possible damaging side effects of modern agricultural technology. On the contrary, governments should make every effort to protect the health and welfare of their citizens. But we must also become more knowledgeable and realistic about science and technology and their relationship to food production in our interdependent world.
>
> "In our view, the antiscience and antitechnology bias so prevalent in affluent countries is both hypocritical and potentially damaging to the Third World. In effect, the haves are telling the have-nots that they should stay with their pristine, rural bucolic, miserable lifestyles, since greater material well-being isn't what it's made out to be. Yet people in the developed worlds are healthier and have the prospect of leading longer, more productive lives than ever before."

Let me expand on a point made by Dr. Borlaug. He talked about the additional resources which would be necessary to produce pesticide-free. In my own case, to maintain my net cash farm income in order to support my family, I would have to increase the number of acres planted to crops. The land I would bring into production would be marginal, or fragile, land which could have environmental problems of its own. We in agriculture have retired much of the erosive land and it would be a shame to force it back into production for this reason, creating other adverse environmental impacts by trying to eliminate very sound scientific based agricultural practices.

LISA PILOT PROGRAM

Some in Congress have suggested that in order to increase the usage of LISA, pilot programs should be implemented. Again I suggest that most farmers are practicing "low input" management. But, if LISA is defined in one of the restrictive ways mentioned earlier, then lower yields may result. If the ultimate definition forces management changes, a voluntary pilot program to test such practices may be an appropriate option. We would, however, encourage Congress to keep the following thoughts in mind.

Some have suggested that "low input" producers should be given priority access to loans for the installation of conservation structures such as terraces and waterways. Loans would be available for establishing forestation, permanent pastures, pollution controls and energy saving measures. While ASA has no problem with loans being made available for these purposes, we are concerned about giving such loans priority status. Such funds are limited and traditional practices must have equal access to loans as well.

Proposals have also surfaced which would mandate the level of participation in a LISA pilot program. If such requirements are legislated, ASA encourages Congress to be realistic in the goals placed on a number of acres per year basis. ASA is also concerned about what will happen to a participating farmer at the end of the pilot program. Would the producer be allowed to return to traditional "low input" (as I have defined current practices) practices with no penalties, or will the producer be required to continue LISA agriculture practices?

Many LISA proposals have included yield and base protection provisions. While ASA has no problem with protecting the base and yields of farmers who voluntarily participate in pilot programs, protection in the future years may not be advisable. If, after participating in a pilot program, a producer determines that LISA practices are beneficial to his operation, then the program benefits should be based on production under the LISA system and not based on past management practices.

In order to promote a LISA program with chemical-free production as its ultimate goal, Congress would need to budget federal funds to make LISA practices viable and potentially profitable. This may be particularly true while the practices and concepts involved with LISA are in transition. ASA is concerned that tight spending policies could cause other programs to suffer financially in order to provide the monies needed. This approach appears to respond to concerns by some that land maintenance and increased agricultural production practices have destroyed precious natural resources. While ASA may not agree with the above concerns, there are programs currently in place to meet these concerns -- sodbuster, swampbuster, the Conservation Reserve Program, and conservation compliance. Current tools should be used to meet these needs rather than creating new costly programs.

BIOTECHNOLOGY RESEARCH TO FURTHER REDUCE CHEMICAL USAGE

In order to reduce inputs of plant nutrients and plant protection chemicals while maintaining profitability, further production research is needed. We favor a broad based, well-funded program of basic and applied research. Examples of past successes in integrated pest management research include the boll weevil eradication program which has helped reduce pesticide use on cotton in North Carolina and South Carolina from 50 to 70 percent. Sterile pink bollworms released on cotton in California has reduced pesticide use for some growers by 75 percent. Research is the key to increasing the ability of growers to farm "low input."

Additionally, new genetic engineering approaches to solving agricultural problems are becoming a reality. We in agriculture are now in the biotechnology age. These new and exciting scientific advancements will reduce the need for chemical-dependent "high input" farm practices. Biotechnology is one of the most rapidly developing applied sciences which hold a rich harvest of breakthroughs. Many predict that the future of agriculture lies in biotechnology. Soybeans varieties able to withstand yield-robbing pests, or environmental hardships, or are capable of being used for new market opportunities, are now a real possibility. The future is bright and just about unlimited. The limiting factor of course is funding.

Federal policy should direct funds at developing this area rather than appropriating funds for yield and base protection in a LISA pilot project. The goal of reducing even further chemical usage in agriculture will be achieved much faster and with more rewards to the farmer, consumer, and the environment by increasing biotechnology science knowledge. Senator Fowler, I have had biotechnology scientists in Georgia tell me personally that with the proper funding, biotechnology advances will allow soybean producers to reduce pesticide usage by very high percentages.

The August 1988 issue of Biotechnology states on its cover, "Soybean Breakthrough: The First Engineered Stable Crop." What once was a dream, then rumors, are now being reported. Things like:

- Soybean regeneration from tissue culture is now routine.
- Transgenic (transferring foreign genes from one source to soybeans) soybeans are being produced.
- Understanding chromosome characteristics that carry the life code for soybeans. This aids soybean breeders in developing new soybean varieties.
- Progress is being made in developing the soybean gene map.

But a whole host of potential uses of genetic engineering exist. Remember that some of these uses may be available to researchers in months, and available to soybean farmers in a few years. The quicker the farmer gets the technology the better. These uses include pesticide resistance, insect control, plant disease control, growth regulators, and soybean composition improvement. Biotechnology will have an enormous impact on future soybean production. We have come a long way in the past few months and the future looks extremely bright.

SUMMARY

In summary Mr. Chairman, we believe that most farmers are currently practicing sound management techniques and could benefit from expanded educational programs which encourage adaptation of new, profitable environmental practices. Additional funding toward biotechnology research would be a positive approach soybean farmers would support. This increased research would accomplish the goal of even further reducing the use of agricultural chemicals. Farmers simply want to produce profitably for the domestic and international markets while maintaining environmental quality. To suggest, as some have, that farmers are not conscientious in their farming methods and have little concern for the environment is simply not true. Farmers are true environmentalists and stewards of the soil. Farmers live on the land, feed their family and others from the land, and take great pride in the environmental soundness of their land. Specifically, farmers and their family drink groundwater and have little desire or incentive to practice unsafe farming techniques known to damage the environment.

Once again, Mr. Chairman, thank you for the opportunity to discuss this important area with the Subcommittee. The actions this Congress takes in the 1990 Farm Bill which affect the agricultural and conservation practices of farmers will hopefully enhance producers' ability to farm profitability and in an environmentally-sound manner. We only ask that serious consideration be given to these policies which, if made in a vacuum without thorough evaluation of the ramifications on farmers and the food supply, could severely cripple this nation's number one industry, agriculture.

Senator FOWLER. Let me interrupt you, if I can, Mr. Adams.

Mr. ADAMS. Yes, sir.

Senator FOWLER. On that point, a recent survey that the committee received said that 80 to 85 percent of all farmers get their chemical and fertilizer application information from the chemical and fertilizer companies or the dealer, which says an awful lot for the trust that the farmer places in their local agribusinessman, but it might not say too much for government education programs in the past.

First of all, do you agree basically with that survey, that that is where the majority of farmers get their information? What do you suggest, in light of what you were saying about research, that might help increase reliance on the education programs and the Extension Service?

Mr. ADAMS. I think, Senator, based on my experience in my part of Georgia, that is probably not a particularly true statement. It may well have been true 5 or 10 years ago. In fact, I know we used to spray if our neighbor was spraying. We just assumed that we had a problem if he had it, but it's amazing what has happened in our area of Georgia in the last 5 years.

Almost every farmer I am aware of, farmer of consequence, as far as one who is really a top manager, is using an independent source or one who is quasi-independent to make these decisions as to whether to spray or not. In other words, it is also backed up, say, by the county agent, where that information is taken and with scouting out in the fields, finding out what insect levels, both the beneficial level and also those predatory insects, and that decision is made based on guidelines developed by the university.

Now we are in the process of funding some programs where a computer model will make the selection and the choice of whether to use insecticides or not, based on what is actually occurring in that field as far as scouting levels. That program, we used it on our farm this past year with very good results, so I think we are moving in that way of making rational third party decisions, even more so in the future, but there is the backup of the county agents.

Senator FOWLER. Well, I do want to commend you and your organization for encouraging farmers to take the lead in these very complex problems of the environment and food safety, especially as a leader and president of one of the largest farm organizations in the country.

We will come back to you. Let me move on.

We welcome Mr. Donn Klor, a farmer and president of the Illinois Sustainable Agriculture Society from Buffalo, Illinois.

Senator BOND. Mr. Chairman, I would also like to welcome a neighbor, to see somebody who is not from Georgia. [Laughter.]

It's really good to see the diversity on these panels that you have brought in. We have some fine panels, and I'm glad we are getting——

Senator FOWLER. You will remember that I even came to Missouri, to hear all Missouri. [Laughter.]

Senator BOND. Well, and I think we have caught up. We have balanced it now, and I am delighted particularly with the fine witnesses you have had from Georgia, but we are delighted to welcome a couple of good midwesterners as well.

Senator FOWLER. Thank you.

Go ahead, Mr. Klor.

STATEMENT OF DONN KLOR, PRESIDENT, ILLINOIS SUSTAINABLE AGRICULTURE SOCIETY, BUFFALO, IL

Mr. KLOR. OK. Thanks to both of you.

INTRODUCTION

My name is Donn Klor. My wife and I operate a cash grain operation in central Illinois—pretty common, growing corn, soybeans, a little bit of wheat and a little bit of oats.

I am the current president of the Illinois Sustainable Agriculture Society. It is a new organization. I think it is probably relative to a lot of new organizations that have kind popped up in the last year or so. Relating to sustainable agriculture, what is it, it has kind of a common theme through it, rather a consensus, if you will.

SUSTAINABLE AGRICULTURE CONCEPT

Sustainable agriculture, if you ask 100 people, you get 100 definitions. One of them we like to use is EEC, and not the European Economic Community. We like to use economic, environment, and conservation, blending those three, realizing it has to be different on each different farm.

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I feel very strongly that there are many, many parts of this bill that we enjoy, and that the sustainable ag concept, or LISA as it has been called, is good for the country. It is good for the farmers, and it is nice to find something that is actually good for the farmers.

Sustainable farming systems also aim to enhance profitability by reducing the need for purchased inputs, which is a different twist, you know. What is better, to spend $200 in trying to raise your yield and maybe get a $50 net, or spend $50 and get that same $50 net for the farmer, down on the farmer level? That is kind of a different twist, whether it is volumes or whatever.

We think conservation is a big part of the sustainable system, when we realize the conservation plans have come in, and we also have to stop and think that those plans are not yet implemented. I think that is something that we need to look at in the future.

On our own farm we have begun to adopt several of these sustainable practices with very good results. We have reduced our fuel consumption by 40 percent. We have been able to reduce our chemical use by 75 percent—not totally eliminate, but reduce it considerably—and by just using a product where a specific need arises, we feel we are getting the best of both worlds.

I do a little bit of research work with the Rodale network. I am one of the cooperators, and one of the things that we are interested in doing is looking at different cover crop systems to improve soil tilth and compaction studies. They are compaction studies but they are not necessarily related to how you would farm, perhaps, in a sustainable system.

Like farmers all over the country, I am trying to find out what works and what doesn't. It is very exciting. My only regret is that more of this type of work is not being done through publicly funded research and extension. I would like to find somebody else doing it, so I wouldn't have to eat all the costs when I make a mistake.

THE LISA RESEARCH PROGRAM IN OUR OPINION IS WORKING

The LISA research program in our opinion is working. To many it is misunderstood. More research proposals have been generated to benefit the farmer himself and the environment in the last few months than in many years prior to the program.

ATTENTION NEEDS TO BE GIVEN TO THE STRUCTURE OF FARM PROGRAMS

Beyond research, we think attention needs to be given to the structure of farm programs, whether it be base acreage systems, to increase flexibility. Farmers seeking to enhance conservation and reduce inputs should receive some kind of base payment protection. It is a very important part of the bill.

Let me jump down here a little bit because of the time. Another issue that is a disincentive to sustainable practices is—for instance, I will just pick one of the areas, oats—roughly from Missouri upward oats could be grown but they are not. There is supposedly a big demand for oats but there is no price. Maybe instead of supporting corn so heavily, maybe we should be looking at adjusting so that oats can be grown in areas and receive the same type of protection, just economics.

Another instance, some farms only have a corn base. How do you move into other program crops if you don't have any base? Cost-share could be done. We have built a lot of terraces over the years. Those were good moves, but where we slipped up is, we have not adapted any practices to keep that soil in place on the terrace, and we turn around and reclean the terrace out, and do it again and again and again. I think we should be looking at more ways to control that.

ORGANIC FOOD PRODUCTION

Let's see. The last thing toward the end of the bill that we really liked was the perception here of organic food production. I am by no means an organic producer. We do have a lot of interest in the organization: What is it? What do I have to do? Is there a market there for it? We think probably a definition would be good for everybody concerned. Some people can work on that if they only know what it is. As far as people that are afraid of the organic, it's an open market. If people want it, let them have it.

Farm loan protection we think is a good point. Special Federal help we think could set precedents down the line.

Senator BOND [presiding]. Well, if you can wrap it up, unfortunately we have so many witnesses. We will take your entire statement for the record. If there are any concluding views, we will take your statement, and thank you very much.

Mr. KLOR. I am just going to thank you, and I wish you would have touched me earlier. I just can't stand long people, either.

[The prepared statement and attachment, Commodity Program Policy Options for the 1990 Farm Bill of Mr. Klor follow:]

Statement of Donn Klor
President
Illinois Sustainable Agrculture Society
before the
Conservation and Forestry Subcommittee
Committee on Agriculture, Nutrition, and Forestry
United States Senate

June 22, 1989

I am Donn Klor. My wife and I operate a cash grain farm in central Illinois, growing corn, soybeans, wheat, and oats. I consider it a real honor to be here this morning to discuss important issues facing agriculture in America.

I am the current president of the Illinois Sustainable Agriculture Society, a statewide network of farmers and others working together to promote the development and use of sustainable farming systems. The Society was founded just last year and is one of many such sustainable agriculture groups that have sprung up in recent years in states accross the country. A majority of the members of our Society are farmers and most of the rest are engaged in research, education, and conservation endeavors.

As president of ISAS, it has been my privilege to also participate in the midwestern Sustainable Agriculture Working Group, a network of farm, conservation, religious, and rural advocacy groups which has coalesced to share ideas and develop farm policy options. We are also an active participant in the Sustainable Agriculture Coalition, a group which collaborates to advance a common policy agenda on sustainable agriculture with regard to the 1990 farm bill, appropriations legislation, and other legislative initiatives and adminstrative issues. At the end of my statement, I have attached for the record a copy of a commodity program options paper prepared for the Working Group.

I would like to discuss my experience with low-input sustainable agriculture, but would first like to thank Senator Fowler for taking the initiative to put together S. 970, the Farm Conservation and Water Protection Act. There are many parts of this legislation which relate to sustainable agriculture. The bill sets an excellent foundation on which to build a new farm legislation that addresses conservation and agricultural practices in a careful and serious new way.

The sustainable agriculture concept - or LISA as it has been dubbed by USDA - is good for farmers and the country. It is an approach to farming aimed at protecting and restoring the natural resource base, promoting opportunity in family farming, producing quality food, and protecting human health. Sustainable farming systems also aim to enhance profitability by reducing the need for purchased inputs and capital investments through greater use of on-farm resources and increased reliance on the farmer's skilled labor and management.

LISA-type programs have been falsely accused of being "no-input" and out to eliminate any and all commercial products. The portrayal of LISA programs as "no input" or "benign neglect" is in very serious error and very misleading to farmers, educators, industry, and the public. Sustainable agriculture is management-oriented and aims to make use of the best blends of low-cost resources, sound conservation, and modern technology. Any time research is dedicated to lowering input costs, that is very valuable to the producer. Many in industry and the research system would have us focus only on the potential cost per unit of sale for the finished product or commodity. But from a risk standpoint, lowering input costs and having the same net income is much more desirable. We have only to ask ourselves, for example, if we want to risk $100 per acre to receive a net of $50, or do we want to invest $200 and perhaps slightly increase our yield, but still end up with the same $50?

On my own farm, I have begun to adopt sustainable practices with very good results. Through a combination of crop rotations, ridge tillage, banding, light cultivation, and careful management, we have reduced fuel consumption by 40 percent and have had fields where we have reduced chemical use by 75 percent and greater. By using chemical products when a specific need arises, we feel we are making the best of both worlds - improving the environment and surviving economically.

As an on-farm research cooperator with the Rodale network, I am also testing and experimenting with further cost-cutting and resource-enhancing measures. In one trial, I am trying different cover crop systems to improve soil tilth. I am also comparing compaction and other data from my main operation with a small plot that I rip up each year with the plow. Through these types of efforts, like farmers all over the country, I am trying to find out what works and what doesn't work. This is exciting. My only regret is that more of this type of work is not being done through publicly-funded research and extension.

Let me note that the LISA research program is working -- though to many it is still misunderstood -- and I sure hope that the program grows. More research proposals have been generated that benefit the farmer and the environment in the last few months than in many years prior to the program. I would urge that appropriations for the program be substantially increased this year and that during the farm bill process, sustainable agriculture be made a major mission and institutional priority of the research and extension system.

Beyond research, attention needs to be given to structure of our farm programs. We need to reform the base acreage system to increase flexibility and encourage sustainable practices. This can be done in at least two ways. Farmers using extensive crop rotations, cover crops, and green manures to enhance conservation and reduce inputs should receive base and payment protection and should have their reduced acres requirement decreased or eliminated in proportion to their contribution to supply control resulting from their alternative practices. This is a very important part of the Fowler bill and a crucial step in the direction of eliminating barriers to sustainable practices and establishing a more level playing field.

An additional or alternative approach would be to limit the percentage of total tillable acres which can generate deficiency payments for soil depleting surplus crops. This approach offers a more economically and environmentally rational supply control method than the current system of idling some acres and pouring on the inputs on the remaining acres. We could make fuller use of our land base and less use of chemicals by rotating with soil building, less-chemically intensive crops. This would increase efficiency and sustainability, while protecting farm income.

Besides the base issue, another disincentive to sustainable agriculture regards the support price of different commodities. Oats is a prime example. Since the program support for oats is so low compared to corn, we have a built-in bias against oats. We have a situation where people want oats for human consumption, it is an environmentally beneficial crop to grow, but at the same time, we have created an economic reason not to grow them. The target price for oats, an excellent crop in sustainable rotations, should be raised relative to corn. Other good rotation crops, such as alfalfa and triticale, should also receive target price coverage, or should be allowed to be grown on some portion of planted acres and paid as if planted to corn.

To implement a new worthwhile program and to help it gain acceptance, we need to help farmers make the change. Cost share, FmHA loans, and other means of assistance should be considered for well-defined, targeted sustainable agriculture objectives. In the past, we have been willing to cost share and loan money for conservation structures such as terraces and waterways, and watched them become useless in just a few years because no change was made in the farming practice itself. We need to provide adequate incentives to ensure the adoption of alternative farming practices. Another intriguing possibility would be a two-tiered target pice system, where farm management plans incorporating sound stewardship and sustainable systems would be given an extra percentage of protection for a specified number of years to encourage the transition. This would help offset the costs of conversion and the educational changes needed in the management of the new systems.

In our organization, we receive numerous requests and comments concerning organic food production. While I am in no way considered an organic farmer, it would be in everyone's best interest to have a nationwide definition or standard of what exactly is and isn't organic. The public needs to know what organic is, and a producer needs to know what is required of him should he choose to fill that market niche. With the level of present concern, it is the least we can do to at least define it and try to standardize requirements between and among state and private certification programs.

To summarize, we need more LISA research and extension, we need base flexibility, we need to remove disincentives and adjust incentive programs to promote sustainable agriculture, and we need to maintain and improve our conservation programs.

Thank you for the opportunity to testify and thank you again for your creative and far-reaching legislative proposal.

March 1989

COMMODITY PROGRAM POLICY OPTIONS FOR THE 1990 FARM BILL

Prepared For the Midwest Sustainable Agriculture Working Group by
Ron Kroese, Land Stewardship Project

The Sustainable Agriculture Working Group supports the concept that farm program benefits should be targeted to increase the economic opportunities for people to own and operate farms and to undergird the basic income of families who live and work on their farms, who depend upon their farms for an important part of their livelihood and who are willing to farm in an environmentally sound manner. The following paper briefly examines how current commodity programs are operating at cross purposes to a stewardship-based, sustainable, family-farm system of agriculture and offers suggestions for policy changes that we believe will move U.S. agriculture toward such a system.

Numerous farm-level studies comparing low-purchased input, sustainable farming systems with conventional systems clearly have demonstrated the efficacy of sustainable agriculture. Several institutional and on-farm research projects during the past two decades have shown that sustainable farming practices can eliminate or greatly reduce the use of petrochemicals with only modest, if any, reductions in yields. These studies also have shown reduced production costs, increased net returns, and improved energy efficiency. (Buttel, et al.). Other macroeconomic and broader social benefits frequently cited in examinations of organic and lower-input farming approaches include: decreased soil loss and run-off, reduced depletion of fossil fuels, improved fish and wildlife habitat and the protection of the productivity of the land and quality of the water for future generations. (Cacek, Langner).

Recent studies also have shown that long-term exposure to agricultural chemicals poses significant health risks to farmers and persons living near fields where chemicals are intensively applied. (National Cancer Institute) Farmers themselves are increasingly aware of the dangers posed by chemically intensive farming methods. A recent nationwide survey, cited by Sen. Wyche Fowler in the introduction to his "Farm Conservation and Water Protection Act," revealed that 97 percent of farmers agreed that contamination of groundwater by fertilizers, manure and agricultural chemicals is a problem.

The obvious question for policy makers concerned about improving the quality of U.S. agriculture and securing a sustainable future for rural America, is: If sustainable agriculture is so great, why isn't everybody doing it? Some obvious reasons come to mind immediately, and recently many articles have appeared and speeches have been made citing examples of impediments to farmer adoption of lower-input, more sustainable farming approaches. For example, University of Minnesota agricultural economist Dr. Steven J. Taff, in a speech last April before a sustainable agriculture forum in St. Paul, stated:

"The principal cause of the observed reluctance of farmers to adopt sustainable techniques, even techniques that have been demonstrated to be cost competitive on a per-planted-acre basis, is the set of institutions (or policies or laws or property rules) that have grown up around conventional systems. These institutions so structure long-term costs and incomes that it is simply not in the typical farmer's interests to shift techniques -- as long as those institutions remain in force."

He continues, "Government price supports provide enormous incentives to produce a handful of crops at output levels exceeding what they would be without this form of government intervention in output markets. This program works against a wide-scale adoption of sustainable agriculture techniques to the extent that new systems would require a change in crop selection or crop rotation. ...If a sustainable system requires a shift in cropping patterns, the farmer will end up growing less of the lucrative program crops. In addition, the current rules governing the price support program work against rotation techniques by assigning acreage bases calibrated to average plantings of the program crop over a period of years."

This criticism also is detailed in a paper by Malcolm. H. Fleming, entitled "Agricultural chemicals in ground water: Preventing contamination by removing barriers against low-input farm management," that appeared in the Summer, 1987, issue of the American Journal of American Agriculture. In noting that taxpayers spent $26 billion in 1986 to stabilize crop prices and that nearly 85 percent of U.S. corn acres was planted by farmers who participated in federal commodity programs, the article points out:

"Federal support programs are focused on four crops that account for at least 65 percent of all agrichemical use: corn, cotton, wheat, and soybeans. Unfortunately, federal programs can do more than just discourage farmers from using fewer agrichemical inputs, they can even influence farmers to increase their use of agrichemicals. This occurs because support payments are calculated on a flat per unit basis; the more farmers produce, the more total support they receive. Not only do support payments tied to production levels tend to increase total crop production, they also tend to encourage more intensive production..because support payments raise the 'breakeven point' for chemical applications. ...The breakeven point is where the cost of applying additional chemicals just equals the value of the additional crop produced by the extra chemicals."

The article goes on to point out that acreage diversion programs intended to reduce production also tend to encourage increased chemical use on planted acres since producers are free to intensify cultivation and use more chemicals on acreage they do plant.

Douglas Young and Walter Goldstein, their 1987 case study comparing conventional and sustainable farming approaches in the Palouse region arrive at essentially the same conclusion:

"U.S. commodity programs encourage intensive production of selected crops with high levels of agrichemical inputs through two principal mechanisms. The first is by restricting program payments to only certain agricultural products. The second is by making payments for many commodities proportional to historical production of the commodity."

In their 1986 paper on the rationale and prospects for sustainable agriculture, Buttel and co-authors concur that commodity policies have been a major contributing factor in shaping American agriculture and its bias against smaller farms and lower input agriculture: "Public policy, especially tax, credit and commodity policy has probably been at least as important as technology in shaping structural change in U.S. agriculture."

In his recent book, "Family Farming: A New Economic Vision," Marty Strange writes that current commodity programs are at odds with a sound agriculture policy at almost every turn:

"Current commodity programs work against themselves. They encourage production of crops in surplus and offer only anemic voluntary incentives to curtail production. Yet they allow free-riders who do not participate in the he cutbacks to benefit from the higher prices that result. These programs further reward expansion because their benefits are tied to the volume of commodities a farm produces and to the amount of land in the farm. They help the biggest farms the most and protect unwise investments in land."

Clearly there is wide agreement that public policies, especially federal programs designed to regulate production of commodities, must change if the U.S. is to attain a low-input, sustainable family farm-based agricultural system. Proposals range from calls for demand-based supply management with loan rates approaching parity to "decoupling" farm income support from production altogether, to a variety of suggestions that basically adjust and amend current programs.

The organizations working within the Sustainable Agriculture Working Group are united in their commitment to promote public policies that will help sustain the gifts of soil and water, strengthen opportunities for farm families and rural communities, produce quality food and fiber, and protect the health of producers and consumers alike. These policies have at their center the concept of targeting federal farm programs to the relationship between people and production. As Strange puts it in his book:

"Commodity programs as we know them are ineffective because they have been misdirected to benefit farms. They should be replaced with a farmer program rewarding good farming practices and pegging benefits to the people who farm rather than to commodities they produce. Such a program would allow commodity markets to do the one thing they do best -- tell when too much or too little of something is being produced -- while leaving more important matters such as conserving natural resources, protecting competition, and stabilizing the income of farmers to government regulation."

In this regard, farm programs should indeed be uncoupled from the production of specific commodities, then recoupled to sound farming practices. (We are convinced that simply "decoupling" -- severing the link between farm production and farm program benefits -- would be bad policy, since it would likely reduce the number of families making a living from farming and undercut incentive-type conservation programs, such as the Conservation Reserve Program and sodbuster/swampbuster. Perhaps most importantly, decoupling would sever the vital link of accountability between the American taxpayer and our food production system — a foolhardy move toward domestic insecurity in a nation where all of us who eat are dependent upon the three percent of us who are food producers.) Farmers should be supported for farming well -- for "meeting the expectations of the land," as Wes Jackson puts it -- and commodity programs should stimulate farmers to practice careful stewardship by diversifying crops and livestock, rotating crops, and greatly reducing the use of toxic chemicals.

Recommendations

In general, the Sustainable Agriculture Working Group supports the concept that farm program benefits should be targeted to increase the economic opportunities for people to own and operate farms and to undergird the basic income of those families who live and work on their farms, who depend upon farming for an important part of their livelihood and who are willing to demonstrate a commitment to careful stewardship of the gifts of soil and water. Such an approach to supporting U.S. agriculture would reduce program expenditures, strengthen family farm agriculture, and preserve the environment for future generations. With that commitment as a framework, the Working Group makes the following recommendations for commodity program changes:

I. Base and Yield:

Base and payment protection should be extended to all farmers who employ environmentally sound crop rotations. Farmers should be encouraged to plant up to 40 percent of farm program base acres to a resource conserving legume or legume/small-grain mixture as part of a soil conserving, water-protecting crop rotation, and retain the base and receive the same deficiency payment as he/she would have received for planting the program crop.

If additional budget savings are required, the base and established yield system by which farm program payments are calculated should be extensively reformed. The current program rewards farmers with higher payments for devoting all of their acreage to supported crops, such as corn and wheat, that produce higher revenue through government programs. In order to achieve as high yields as possible to be eligible for maximum government payments, these crops usually are produced with high levels of synthetic chemicals and fertilizer and often are grown in a manner that depletes the soil. This makes the program more expensive and encourages over production, even as the program pays farmers to idle land to reduce crop production. And it worsens the growing problem of water contamination by fertilizers and the pesticides necessary for continuous production of crops such as corn.

To save money and protect the environment, Congress should provide that no farmer receive payments for producing corn or wheat on more than two thirds of his/her total tillable acres. Furthermore, all proven yields above the county average should be reduced to the county average. Such a reduction would insure that no farmer receives a farm payment bonus for fertilizing heavily to produce yields higher than the county average.

In the long term, base acres for farms should be fundamentally redetermined, not according to cropping history, but according to the suitability of the land to grow the respective program crops. The bases could then be adjusted annually for major crops to reflect national needs and prevent overproduction.

II. Targeting Payments

To more effectively and consistently direct farm program benefits to family sized farms, and cut costs, a new limit should be placed on the volume of production supported by the program. Deficiency payments -- the amount paid by USDA to producers to compensate for low market prices -- should be made on no more than $80,000 worth of farm commodities, based on no less than their 1990 target price as established in the 1985 Food Security Act. In effect, this would mean that the government payment to corn-based farmers would be limited to approximately 30,000 bushels of corn per farm (or 20,000 bushels of wheat for wheat-based farmers). Payments could be made above these bushel limits, up to the $50,000 payment limitation, to keep larger farms in the program. However, these additional payments would be pegged to a significantly lower target price.

Eligibility for the higher (1990 level) target price would be phased out as the total non-farm income of an eligible producer increased to between the national median income and two times the national median income. Further, eligibility for the higher target price also would be phased out at total (farm plus non-farm) family income increased to between two and three times the national median income. (For 1988, national median income was approximately $30,000.)

In addition, program enforcement should be further tightened to prevent multiple payment to the same beneficiaries. Participating producers should be required to file a certificate of beneficial ownership each year in order to facilitate better enforcement of program rules.

III. Acreage Reduction

To further bring production under control in an environmentally responsible manner, the USDA should establish a program of multi-year set-aside contracts for a minimum period of three-years, requiring that at least 20 percent of the land taken out of production each year be included in such multi-year contracts. Any highly erodible land included in multi-year contracts should be established in permanent cover. All other lands included in any set-aside or diversion programs, including annual set asides, should be required to be rotated and sown in a soil-building legume crop to provide full year protection, with up to 20 percent reserved for wildlife habitat. Cost-share funds should be provided to compensate farmers for costs in establishing vegetative cover.

IV. County Committees

It should also be noted that since nearly all of the reforms recommended in this paper require a more detailed understanding and accounting of farm programs at the local level, it may be necessary to use a portion of the funds saved by more carefully targeting farm program benefits to increase funding for county-level ASCS and SCS offices. It is also crucial that the county ASCS committee system be overhauled to give more real decision-making power to county committees and to make more resources available to such committees so they can adequately meet the demands of farm programs that are environmentally sound and directed primarily to small- to moderate-scale farm families.

V. Demonstration Program

Further federal efforts also are needed to encourage more producers to adopt low-input sustainable farming practices. We share Sen. Fowler's view that this could best be accomplished by a five-year demonstration program that would develop and demonstrate new program initiatives with willing farmers. Those initiatives which prove valuable in fostering wider adoption could then be expanded for wide participation in the future. Such a low input, sustainable agriculture demonstration program should have a goal of enrolling no fewer than 25 million acres by the 1994 crop year and include the following components:

--Prompt development by USDA of a sustainable agriculture field technical guide or guides for use by Extension and SCS personnel in their work with participating farmers. The guide(s) should include information targeted to meet the special qualities and needs of the various agricultural regions of the nation.

--Formulation by local USDA personnel, working closely with participating farmers, of five-year farm conversion plans designed to reduce soil loss levels to T and synthetic chemical use to less than 60 percent of the amount used by conventional farmers in the respective cropping regions.

--Deficiency payments to participating farmers should be based on target prices as of 1989 and could not be reduced during the demonstration period. Established yields used in calculating deficiency payments could not be reduced on participating farms despite any reduction in crop yields that might result from practices employed in carrying out the low-input management plan during the five-year period.

--Set-aside requirements should be reduced on participating farms to reflect any reductions in production that may result on the farms due to adoption of reduced-input farming methods, crop rotations or soil conservation practices.

--Substantially reduced crop insurance premiums should be made available to farmers participating in the program.

--Farmers participating in the demonstration program should receive priority status in receiving FmHA loans for soil and water conservation practices and structures necessary to successfully participate.

While the preceding recommendations to improve federal commodity programs are far from exhaustive, all of the proposals would strengthen the family-farm system, help improve the environmental impacts of agriculture, and, as a whole, save the government money, especially in the long run. The recommendations will not in themselves insure a fair price for farmers committed to farming the land well. Rather, the recommendations are aimed at moving American agriculture in a direction that supports a family-farm structure and rewards stewardship-based farmers with a fair and reasonable income.

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Senator BOND. Since our chairman is not here, let me move along and introduce a gentleman who is certainly no stranger to this committee, Mr. Dean Kleckner, president of the American Farm Bureau Federation. Dean, welcome.

STATEMENT OF DEAN L. KLECKNER, PRESIDENT, AMERICAN FARM BUREAU FEDERATION, WASHINGTON, DC

Mr. KLECKNER. Thank you, Senator Bond.

INTRODUCTION

I am Dean Kleckner. I farm corn, soybeans, and hogs in northern Iowa, and I am here representing the American Farm Bureau Federation. I am very pleased to be here.

The Food Security Act of 1985 was the first major initiative to link together agricultural and the conservation goals. Out of that we have swampbuster, sodbuster, the Conservation Reserve Program, and the conservation compliance, and they established precedents that many wish to build and expand upon in the 1990 farm bill. This proposal, S. 970, is the first opportunity to do it, and I would like to commend Senator Fowler, the chairman, for providing an opportunity to discuss and debate this concept well ahead of the 1990 farm bill.

Reconciling generally accepted agricultural practices with our environmental and conservation goals has become one of the most significant challenges that we in agriculture have to face today. We want to know, as farmers, if certain practices and products cause problems. No one is more dependent on a healthy environment than those of us that live out and farm the land, out in the country.

LOW-INPUT SUSTAINABLE AGRICULTURE (LISA)

Farmers are cautious about LISA. They can't afford to take big risks with a new and unproven technology. What does LISA mean? Does it really offer the promise that many claim, that we heard about earlier today, a safer, more economical and profitable way of farming? Or is it the latest fad? There is a genuine interest in learning more about it.

There are a number of impediments to low-input agriculture. The lack of a clear and consistent definition is especially confusing, and we have heard that already. Everybody has their own definition. Furthermore, many of the definitions carry an overt antichemical bias, and imply or state that normal farming practices are unsound. Such connotations, I believe, reinforce suspicions and suggest ulterior motives by those who promote them.

In considering changes in traditional farm policies, we must proceed cautiously. As we see it, LISA programs represent a long-term goal for agriculture. There is a real danger in diverting funds from research on IPM and BMP in our enthusiasm to support the latest solution to all our problems. IPM programs have a sound, 15-year track record in protecting the environment and maintaining agricultural viability.

LISA may be appropriate for the long term, but we still need BMP's and more IPM techniques that can be incorporated into current farming operations. In other words, we would like to see a more immediate approach to environmental concerns. Successful IPM programs rely on many pest control technologies——

Senator FOWLER [presiding]. Such as what? What would be a more immediate approach to environmental concerns?

Mr. KLECKNER. IPM and best management practices would. First of all we have to define LISA. There are people here, I think, in this room——

Senator FOWLER. All right. I will define LISA for you in just a minute. I can clear that up in a hurry, but Mr. President, finish your statement. I didn't mean to interrupt you. I just wanted to know if you had a specific suggestion for the immediacy of environmental concerns.

IPM

Mr. KLECKNER. We can talk about that a little later, but successful IPM program rely on many pest control technologies, including the use of pest-resistant plant varieties, crop rotations, and the use of cultural practices that preserve predator populations and discourage the pests. Pesticides are used precisely and sparingly.

I have a few examples of successful IPM programs. In Texas they developed a program for carrots in the lower Rio Grande Valley that reduced insecticide use by 66 percent, without loss in yield or quality. Within 1 year, the Texas IPM program reduced the amount of insecticide used on fresh market cabbage by 44 percent. In New York—and I was up there just about 3 weeks ago, and I looked at some IPM procedures—they reduced the amount of pesticide used on apples by 38 percent; on onions, by 31 percent. Potato growers in New York, by using IPM, reduced fungicide use by 21 percent and insecticide use by 7 percent. In addition, insecticide usage on cotton, grain sorghum, and peanuts has been significantly lowered.

We believe strongly that the agriculture community should be given both the opportunity and the incentives to use integrated pest management, IPM. Recently the Farm Bureau joined a newly formed national coalition on IPM. We think it is a significant advancement for IPM research.

We also support biotechnology. It is not a magic bullet. Some of those new technologies we think fit smoothly into farming systems such as LISA and IPM, like disease-resistant plants, plants with nitrogen-fixing capabilities, herbicide-resistant plants, and plants with weed-suppressing capabilities. We think we ought to promote biotechnology as a national priority.

Research has been mentioned. We believe there is a pressing need for more agricultural research. It will allow us to be competitive in world markets and responsive to environmental concerns.

Incidentally, Mr. Chairman, the National Academy of Sciences Board of Agriculture has recently proposed a $500 million competitive grants program within the USDA to revitalize agriculture, and we hope that when that comes before the committee, that you will look with favor on that.

CONCLUSION

Lastly, in conclusion, this year, American Farm Bureau is sponsoring a LISA tour, two study tours in mid-August to compare LISA systems with conventional systems. We are looking at LISA at ridge-till, no-till, comparing it with conventional tillage. It is designed for mid-August to coincide with the congressional break, and we would encourage any members of the committees or your staff to participate in this. We would be happy to help you on that.

Thank you.

[The prepared statement and attachment, Integrated Pest Management: A National Priority of Mr. Kleckner follow:]

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Statement of the American Farm Bureau Federation Before the Senate Agriculture Committee Subcommittee on Conservation and Forestry Regarding S. 970, The Farm Conservation and Water Protection Act of 1989

Presented by Dean L. Kleckner
President, American Farm Bureau Federation

June 22, 1989

Statement of the American Farm Bureau Federation
Before the Senate Agriculture Committee
Subcommittee on Conservation and Forestry
Regarding S. 970, The Farm Conservation and Water Protection Act of 1989

Presented by Dean L. Kleckner
President, American Farm Bureau Federation

June 22, 1989

Good Morning. On behalf of the American Farm Bureau Federation I am pleased to be here today. I would like to share with you our thoughts on S. 970 and to speak generally about the conservation and environmental challenges facing agriculture. Farm Bureau is the nation's largest general farm organization, representing more than 3.6 million member families in 49 states and Puerto Rico.

Mr. Chairman, the Food Security Act of 1985 was the first major initiative to link together agricultural and conservation goals. The "Swampbuster," "Sodbuster," Conservation Reserve Program and Conservation Compliance provisions established precedents that many wish to build and expand upon in the 1990 Farm Bill. S. 970 is the first proposal to attempt to do so. We commend you for providing an opportunity to discuss and debate these concepts well in advance of the consideration of the 1990 farm bill.

Reconciling generally accepted agricultural practices with our environmental and conservation goals has become one of the most significant challenges confronting farmers and ranchers. We want to know if certain practices or products cause problems. No one is more dependent on a healthy and safe environment than are farmers and ranchers who make their home and their living from the land.

Mr. Chairman, in keeping with the intent of this hearing, I would like to take the opportunity to share with you our thoughts and comments on the broader concepts of S. 970, as well as on some of the specific provisions. We will provide specific comment on the groundwater and wetlands provisions at the next hearing of the subcommittee. In addition, I would like to highlight a number of activities that Farm Bureau members have been involved in that relate directly to the issues at hand. Farmers are committed to environmentally sound farming practices.

LOW INPUT SUSTAINABLE AGRICULTURE (LISA)

Farmers are cautious about LISA. They cannot afford to take big risks with a new and unproven technology. What does LISA mean? Does it really offer the promise that many claim--a safer, more economical and profitable way of farming? Or is it the latest fad? There is a genuine interest in learning more about it.

There are a number of impediments to low input agriculture. The lack of a clear and consistent definition is especially confusing.

In my opinion, the term "low input" is not an accurate description. If it were as simple as reducing purchased inputs and reaping the rewards, it would have been in practice long ago. Furthermore, many of the definitions, including those in the bill, carry an overt anti-chemical bias, and imply or state that normal farming practices are unsound. Such connotations reinforce suspicions and suggest ulterior motives by those who promote them.

There is a considerable lack of site-specific, sound agronomic data and technical assistance available to farmers. This is what they need to make the necessary decisions relative to individual operations, crops and pest control needs. At best, much of the information is anecdotal and not easily or reliably transferred. Of particular importance is the question of whether the techniques are profitable and easily adaptable. As with any other business, the net bottom line will be the determining factor whether farmers accept any changes. In many respects the provisions of S. 970 seek to induce participation in low input systems before necessary information and data are available. Much of this data is to be generated on A trial and error basis, rather than having it available to producers before they decide to enroll in the program. The availability of technical guides from USDA may provide some help, but I suspect there will not be enough agronomic research to provide the upfront answers and information that farmers need prior to making a commitment.

In my opinion, "low input" farming is still more a philosophy and spirit of farming than an easily defined set of practices. It should not be anti-science nor anti-pesticide. Rather it should use the best of today's technology, from IPM programs to biotechnology. The term "Integrated Farm Management" is a more appropriate description of this concept. It builds on and expands the philosophy utilized in Integrated Pest Management (IPM) to the entire farming system. It should be based on proven science and sound agronomic research and it should incorporate modern technology to the fullest.

As we see it, LISA programs represent a long-term goal for agriculture. There is a real danger in diverting funds from research on IPM and on Best Management Practices (BMP) in our enthusiasm to support the "latest solution" to all our problems. IPM programs have a sound scientific basis and a fifteen-year track record in both protecting the environment and maintaining agricultural viability. Yet, even with convincing evidence that IPM works and works well, farmers are still reluctant to adopt full programs.

Instead we find they prefer individual techniques from IPM programs that they can fit into their current production management operations. For example, they may decide to use crop rotations, pheromone traps or closer monitoring of pest populations.

It has been difficult to convince farmers to abandon proven techniques and replace them with information-intensive pest control strategies that are still evolving. Now LISA comes along without a definition and with only 2-3 years of hard science behind it. It is even more information intensive, labor intensive and site specific than IPM. Over one-half the farmers work off the farm. Will they be able to switch to a more labor-intensive management system? LISA may be appropriate for the long term, but what we need right now are BMP's and more IPM techniques that can be incorporated into current farming operations. In other words, we would like to see a more immediate approach to environmental problems.

CAUTIONS FOR LISA RESEARCHERS

We do, however, need to proceed with research to determine if LISA systems are feasible for production agriculture. Researchers have been developing IPM programs for farmers for over 20 years and, based on the track record of IPM and production agriculture, we offer the following cautions to LISA researchers:

1. Define your terminology at the beginning. What do you mean by Low Input? IPM ran into snags when some people interpreted it as control without pesticides and others thought it meant simply better timed sprays.

2. Do your homework. Even though IPM researchers had enthusiasm and conviction, it took hard and fast figures showing a better bottom line to convince farmers to risk their income and switch to IPM. Some scientists have expressed concerns that Low Input Ag has an anti-science bias. We hope this isn't so.

3. Just because a production system is Low Input doesn't mean it's inherently less damaging to the environment. Nitrates from animal manures and legumes can reach the groundwater every bit as fast as nitrates from fertilizers. Groundwater quality should be monitored as you conduct your research in the field.

4. The idea of mixing animal and crop production systems is attractive but remember it won't work in every situation. Like IPM, Low Input Ag systems will be site specific.

5. The introduction of alternative crops and crop rotations is also an attractive solution. But we need to keep a few points in mind. Future farm programs will need flexibility to provide for both alternative crops and crop rotations. The impact of such changes on non-program crops and commodities (as well as the impact on the organic produce market which has been established and developed through private initiative and without government help) must be a major consideration. Not all farmers have the equipment necessary to make dramatic switches. And markets have to be researched carefully to make sure the farmer can sell the results.

6. Always keep in mind that the characteristics of any new technology can influence its rate of adoption. Farmers basically ask themselves six questions before they buy in to a new way of doing business:

- Is the technology profitable?
- How complex is the technology? The greater the complexity, the slower the rate of adoption.
- How compatible is the technology? Is it consistent with the existing values, past experiences, and needs of the potential adopters?
- Can it be tried out on a reduced scale? In other words, can the potential adopter experiment with the new technology on a limited basis? This will greatly reduce the risk of inappropriate technology and the learning costs associated with any new practices.
- How big is the package? Remember that low input ag is a collection of management techniques, varying inputs, and information collection. This will be more difficult for the farmer to adopt than, say, an improved seed variety that represents stand-alone changes in technology.
- Does it have an obvious advantage? Are the results of low input ag readily visible to the adopter or others? You will need persuasive evidence to convince farmers to risk their income. Will it be consistent with a market-responsive agriculture that is export dependent and internationally competitive?

We need to keep in mind that both IPM and LISA are information-intensive management systems. In addition, they both require additional labor (for example, to monitor fields for pests, maintain a more diversified agriculture, etc.). These costs and adjustments have to be factored into any discussion about the practicalities of switching from conventional agriculture into "new wave" agriculture.

Farmers and their customers have become dependent on a high-input, high-output industry that consistently produces high quality products. If there is a way to reduce inputs but keep the high outputs, you will continue to have full support from both groups. If you reduce the inputs and jeopardize high output, you will have problems.

PRODUCTION ADJUSTMENT

We must carefully evaluate the extent to which other ongoing programs and projects of the federal government need to be changed to accommodate goals of new systems such as LISA. In this time of limited budgets for new programs, approving additional agricultural program expenditures in one area will mean finding offsetting savings in another. This exercise will require establishing priorities that will include difficult choices. It is not enough to support good programs; we must select to pursue only those that are the best for the value of the scarce resources that can be devoted to them.

We must proceed cautiously in proposing modifications to traditional farm program policies as a means of promoting these alternative practices. In considering changes, we must ask three questions:

(1) What is the direct budgetary impact of a new program? Since most of this expenditure will need to be offset by agricultural program spending reductions, we must consider where the funds will come from.

(2) What kinds of costs will be imposed on farmers? In some cases additional costs will only be borne by those farmers who elect to participate in the new program. In other areas requirements on all farmers to implement a new practice will add to costs of production generally and may hinder our ability to produce in a highly competitive market.

(3) What kind of impact will changing farming systems exert on the interrelated markets for competing and substitute commodities? Providing government encouragement to shift production resources to new uses will nearly always have a negative impact on producers of other commodities that currently have a market niche. While some changes may be encouraged despite these consequences, it is important to know what these indirect effects will be.

The production adjustment programs included in Sections 111, 112 and 113 of S. 970 respond to concerns for encouraging greater use of conservation measures and LISA systems. However, these provisions must also be evaluated in the context of the above criteria.

Allowing farmers to plant up to 40 percent of their permitted acreage to legumes or a small grain/legume mix while retaining the base history would not entail significant budgetary expense or add to the cost of farm program participation for the producer.

However, commodities grown on this program crop acreage will be marketed in competition with commodities that operate outside the authority of government farm programs. The forage will eventually find its way into the market in the form of hay, silage, meat or dairy products.

Even though direct payments are not made to producers on the acreage shifted into the legume crop, the preservation of the base history extends benefits that will encourage additional competition and possibly lower prices for the commodities produced by certain farmers and ranchers. Undoubtedly, those producers will believe that the extension of the base history for program crop farmers is unfair and inequitable if the market for their commodity is adversely affected.

The issue of permitting production of nonprogram crops on crop acreage base has been raised in Farm Bureau voting delegate sessions and in meetings of our Board of Directors. Our members currently favor a limited amount of flexibility to permit shifting of up to 10 percent of the farm acreage base from one program crop to another with the possibility of including soybeans and other oilseeds eligible for the shift. The nonprogram crop producers who make up a large segment of our members have convinced our leaders to oppose allowing production of nonprogram crops on base acres.

Producers are being asked to plant a full season vegetative cover crop (or a legume cover crop) on all program acreage required to be devoted to conservation uses. This will increase both direct federal budget costs due to cost sharing expenditures and increase the cost of participating in the programs for the individual farmer. Also, there are agronomic and entomological impacts to consider with such an increase in large crops.

The source of funds for the cost sharing will have to be redirected from other program payments. We are concerned that the benefits of such a provision may be minimal for land that is flat and not subject to erosion. If this provision is retained in the bill, the requirement and the cost sharing should be modified to apply only in instances where erosion would be a problem in the absence of this authority.

The vegetative cover crop requirement will discourage participation in farm programs because of the additional cost of planting these commodities. While this cost by itself should not force many farmers out of the program, it would be imposed at a time of decreased program benefits and increasing producer obligations under the program. As a result, some farmers will choose to farm without the farm program benefits and requirements. This may have the ironic effect of diminishing the conservation objectives that S. 970 intends to expand.

The section of S. 970 that will promote the use of multiyear set-asides is closely tied to the issue of expanding the Conservation Reserve Program. This will be addressed at a later hearing, but there are several points that should be kept in mind. The use of multiyear set-asides must be considered with a clear understanding of what the demand for the program commodities will be over the course of the next three to five years. Our economic analysis indicates that even under several different sets of assumptions, demand for these products will necessitate lower acreage reduction requirements than have been required during the last four years. Idling large acreage through long-term or intermediate-term contracts could create shortages of supply which will lead to loss of markets for U.S. agriculture. We are very concerned at the prospect of requiring 30 percent of the land set-aside under the programs to be committed to three- to five-year contracts. This would not permit the adjustment that will be necessary to respond to the volatile conditions characteristic of the global agricultural market.

If multiyear set-aside contracts are offered, they should be limited to an amount of acreage that would be less than the minimum amount of set-aside projected by USDA over the period covered by the contract. In making the estimate, USDA should be required to use assumptions that anticipate the strongest demand reasonable. These set-aside contracts should only be offered as part of the entire package of production-oriented acreage reduction programs rather than as a program designed to achieve additional acreage retirement.

The conditions under which the Secretary may waive the provisions of the contract should be amended to include instances where the percentage of acreage enrolled in the multiyear set-aside contracts exceed the amount of acreage that would otherwise be projected in the annual land retirement programs. In addition, producers may need to be limited in the percentage of the farm acreage base that can be enrolled in the multiyear set-aside.

LISA TOUR

The American Farm Bureau Federation has organized two study tours to examine low input and conventional agricultural production systems in August. The tour will compare economic and environmental aspects of low input sustainable agriculture, no-till, ridge-till, intensive mulch-till and organic farming systems that have been in place a long time and some that are just now being implemented on farms as well as at research stations. We plan to bring together 100 to 200 farm leaders, congressional staff, researchers, extension, and others and allow participants to get a unique hands-on feel for soil properties and tillage methods. Each tour will cover 5 Midwestern states, include at least 10 farms and 2 research stations. Tour participants will conduct soil, water and crop observations on each farm. The tour will be held during the weeks of August 13 and August 20 to coincide with congressional recess. Mr. Chairman, we would welcome the participation of your committee members and their aides on these tours. If you would like additional information, I'll be glad to provide it for you.

INTEGRATED PEST MANAGEMENT

In any discussion of reducing chemical inputs in agriculture, it is important to look at the successes attributable to Integrated Pest Management (IPM). IPM is a philosophy of pest control that tries to mesh together a variety of techniques to control pests in a sound and ecologically safe manner. Successful IPM programs rely on several pest control technologies, including the use of pest resistant plant varieties and the use of cultural practices that preserve predator populations and discourage pests. Pesticides are used precisely and sparingly.

Farm Bureau has had policy supporting IPM for many years. The current policy reads:

> We support the widespread promotion and use of integrated pest management (IPM) as a method of reducing costs, risks, liability and total dependence on farm chemicals. IPM can reduce the risk

of output loss, the per-unit cost of production and liability from chemical damages. IPM is a defensible use of pesticides because it focuses use where problems have been identified.

We encourage continued research and development of pesticides which degrade more rapidly, are less environmentally persistent and are compatible with accepted IPM practices.

We support the removal of pheromones from the pesticide classification in order to permit, expedite and encourage their usage.

We support increased biological pest control research to determine where biological pest control measures can provide practical and feasible substitutes for, and supplements to, chemical controls.

We support a "beneficial insects" category in USDA's Competitive Grant's program.

Expanded educational programs are needed to encourage the widespread adoption of IPM. We recommend the addition of IPM instruction to pesticide applicator training programs.

IPM should continue to be a budget priority for USDA and land grant institutions. They should expand their research and development of IPM techniques on a regional basis."

This strong support for IPM from the nation's largest general farm organization is due to IPM's track record. IPM programs in production agriculture have demonstrated that farmers in these programs can reduce the amount of pesticides they need while still maintaining their ability to produce high quality crops for profit.

Some examples of successful IPM programs (taken from the National Coalition on IPM 1989 draft position document and the 1985 CES report on IPM and agricultural profitability) include:

-- a cooperative industry-Cooperative Extension Service (CES) program developed for processing carrots in the Lower Rio Grande Valley of Texas reduced insecticide use by 66 percent (from 6 to 2 applications) without loss in yield or quality. The industry groups involved are Gerber Foods, Inc., and Campbell Foods, Inc. Similarly, within one year, the Texas IPM program reduced the amount of insecticide used on fresh market cabbage by 44 percent.

-- a New York state CES IPM program reduced the amount of pesticide use on apples by 38 percent. The New York IPM program, working with onion growers, reduced pesticide use by 31 percent. IPM potato growers in NY reduced fungicide use by 21 percent and insecticide use by 7 percent.

-- California almond growers, working with the University of

California IPM project, have reduced total pesticide use by 37 percent.

-- Gerber Foods, Inc., in cooperation with the Arkansas and South Carolina CES, funded a pilot peach IPM program which reduced insecticide use on peaches by 33 percent.

-- Similar industry-CES programs are being conducted by Ocean Spray Cranberries, Inc., and the Massachusetts, Rutgers, and Washington CES to develop a comprehensive cranberry IPM program.

-- Del Monte Corporation is working intensively with the University of California IPM project on processing tomatoes and a variety of other IPM projects.

-- on filberts in Oregon, IPM growers reduced pesticide costs by 25 percent.

-- in Washington state, IPM programs on apples were able to cut $330,000 in insecticide costs using a computer model to predict when to spray for control of codling moth.

-- There are also outstanding examples of IPM successes on other major cropping systems.

-- Insecticide use on cotton, grain sorghum and peanuts has been significantly reduced. In 1971 (pre-IPM), U.S. insecticide use on these three crops was 73.4 million pounds on cotton, 5.7 million pounds on grain sorghum, and 6.0 million pounds on peanuts. By the early 1980's, after ten years of IPM, insecticide use on cotton was reduced by 77 percent, insecticide use on grain sorghum was reduced by 56 percent, and insecticide use on peanuts had dropped by 83 percent. During this period, acres planted to these three commodities remained relatively constant. Not only was the total amount of insecticide reduced, but the proportion of acres treated was also reduced. The number of acres treated in cotton was reduced by 46 percent, in grain sorghum by 48 percent and in peanuts by 54 percent.

-- Purdue University's IPM program for control of corn rootworm in Indiana has saved Indiana farmers approximately $7.6 million a year in insecticide costs and about 6.1 million pounds of insecticide that would otherwise be applied to Indiana soils. The primary IPM tactic for control of the corn rootworm is crop rotation (corn/soybean).

-- In Tennessee, IPM programs on soybeans lowered pesticide use by 50 percent, cutting production costs by $3-$10 per acre.

We strongly believe that the agriculture community should be given both the opportunity and the incentives to use Integrated Pest Management (IPM). A few months ago, the National Coalition on Integrated Pest Management was formed to support and advance IPM as a biologically and environmentally rational approach for pest control. The National Coalition on IPM is comprised of representatives from the food processing, agricultural production, nursery, seed, fertilizer, private agricultural consulting and pest control industries as well as farm and environmental organizations. Farm Bureau is an active member of the coalition. The goals of the coalition are to improve dialogue with governmental agencies and public institutions by working with the National IPM Coordinating Committee. The coalition would like to form a industry-government partnership to make agricultural producers and consumers aware of the positive benefits of IPM. This coalition represents a significant advancement for IPM research. For the first time, private industry, and particularly the food processors and marketers, have joined together to promote and encourage a specific philosophy of pest control.

Currently IPM suffers from the lack of funding and well defined goals. We have described 11 major areas in which steps could be taken to improve IPM research programs, accelerate technology transfer to farmers, and make IPM a national priority. We would like to enter our findings into the record along with our testimony today and we urge the Subcommittee members to look at them.

OTHER PEST CONTROL TECHNOLOGIES

Farm Bureau members also support the use of biotechnology to help solve environmental concerns. Biotechnology is not a science. It is a collection of techniques or tools that allow researchers to more precisely influence the exchange of genetic material or desirable traits in living organisms. Although not a magic bullet, some of these new technologies can fit smoothly into farming systems such as LISA and IPM. Some of the breakthroughs which may help farmers deal with environmental problems include the development of disease-resistant plants, plants with nitrogen-fixing capabilities, herbicide-resistant plants (focusing on environmentally safe herbicides), plants with weed-suppressing capabilities, insect-resistant plants, animal vaccines for insect-borne diseases, and enhanced microbial control agents to control insect pests, weeds, and plant pathogens (biopesticides). All of these possibilities will decrease our dependency on agricultural chemical inputs. In addition, the new technologies can engineer microbes to break down some of our more environmentally persistent chemicals.

Although our members feel agricultural biotechnology should be promoted to a national priority, currently, biotechnology labors under several constraints.

1. Because biotechnology is unfamiliar to many people and not well understood by the general public, state and federal regulatory agencies are taking a very cautious approach. Currently, we are probably overregulating this industry. So far there have been no safety mishaps in 15 years of research. We need to be cautious as we take this technology into the field but we also have to recognize the need for field testing to develop the database our researchers need to determine if problems exist.

2. Industry depends on patents to protect its research investments and attract private investors. The patent system has served our country well since 1790. We have to continue to support the Patent and Trademark Office in its attempts to keep up with these rapidly expanding technologies. At the same time, the situation with animal and plant patents has to be resolved. Our members support the use of patents to encourage private sector investment in agriculture. We want to work towards resolving any problems.

3. Farmers are concerned with how consumers react to new technologies. We want to continue to provide the public with high quality, low cost food. Education will play a critical role in determining how consumers react in the next decade as we begin to utilize these new technologies.

4. All farmers should have an equal opportunity to incorporate biotechnology products into their farming operations. We now know quite a bit about how and why farmers adopt new technologies. Farmers that are first in line to try out new products tend to own commercially successful large-scale, specialized farming operations. They are sophisticated financial managers and they look at farming as a business rather than a way of life. They are well educated, highly motivated, willing to take risks, well connected to communication networks, and efficient farm and business managers. In addition, farmers who respond well to biotechnology are younger than the average farmer (who is 52), better educated, newer to agriculture, and farm more acres with a higher gross income than the average farmer.

If we want all farmers to have an opportunity to use these new farming systems, we must assist limited resource farmers to expand their management skills. For farmers who don't fit the early adopter profile, it will be important that we make an extra effort to make sure they have access to the resources needed for successful adoption of innovations.

BEST MANAGEMENT PRACTICES

Best Management Practices (BMPs) are techniques or practices that farmers can adopt to minimize the potential for environmental contamination in their farming operations. The first step in dealing with problems on the farm is to find out if and where problems occur. To this end, the American Farm Bureau Federation published an environmental checklist in 1987 designed to be used on the farm to identify potential environmental risks. The checklist is about 16 pages and takes farmers through their operations step by step, highlighting potential problems and suggesting solutions. Our county Farm Bureaus are encouraged to hand the checklists out during meetings held specifically for that purpose. County extension agents or other specialists are usually on hand to answer questions. The checklist can be modified to fit unique state or even county conditions such as Karst topography or particularly vulnerable soil types. All of our member states have used the checklist to some extent and currently 14 states have reprinted the Self-Help checklist themselves and distributed it. As of June, 1989, well over 300,000 of the "Farm Bureau's Groundwater and Environmental Quality Self-Help Checklists" had been distributed.

State Farm Bureaus are involved in other projects as well that demonstrate our members' concerns about and commitment to protecting the environment. For example:

--Fifty five county Farm Bureaus in Indiana conducted nitrate testing projects as part of their county fair exhibits in 1988.

--The Ohio Farm Bureau has been part of a cooperative nitrate testing program with Heidelberg College and other groups. As of April, 1989, 76 of Ohio's 88 counties participated and 16,166 wells were tested. Ninety-seven (97) percent of the samples were less than the nitrate drinking water standard. And 68.2 percent showed no nitrate contamination at all (<0.3 mg/l). In Ohio, nitrate detection does not correlate well with agricultural land use according to Dr. David Baker of Heidelberg College. What they did seem to find is that certain hydrogeologic areas seem to be more vulnerable than others. Within those areas, shallow, older wells were more likely to show nitrate contamination. Nitrates from septic tanks also were a significant contributor.

--The Mississippi Farm Bureau is involved in a pilot program to dispose of pesticide containers in one of its largest agricultural counties starting the summer of 1989. The Oregon Farm Bureau helped initiate a voluntary disposal program for empty pesticide containers back in 1984 along with the Oregon Agricultural Chemicals Association.

--The Pennsylvania Farmers Association is offering a nitrate test kit to members for $4.00. Montana Farm Bureau is working with Extension to develop an education and well testing program. Kansas Farm Bureau initiated a well testing program with a private lab. Illinois has worked with their state veterinary lab to offer pesticide testing of well water on a limited basis.

--The American Farm Bureau Federation initiated its own Conservation Tillage Action Plan in 1983. It is designed to encourage state and county Farm Bureaus to take a more active role in promoting conservation tillage. County Farm Bureaus in South Carolina, Tennessee and Indiana contributed funds or time to set up demonstration and equipment rental programs for conservation tillage equipment. The Ohio Farm Bureau, Soil and Water Conservation Service, Extension, and EPA are working jointly to promote a conservation tillage program with Ohio farmers. The group is interested in developing economic incentives to encourage farmers to adopt conservation tillage practices. The Utah Farm Bureau is spending this entire week (June 19th) working with SCS and Extension in a series of Conservation Tillage and Soil Compaction Workshops in an effort to reach its members.

--Over 1,000 copies of AFBF's booklet "Farm Partners, Have You

Hugged Your Soil Lately?" have been distributed. Also, over 40 sets of a slide show illustrating the program have been distributed. The material takes a systems approach to soil compaction, erosion and protective soil cover. The workshop includes actual field experience and stresses cooperation with local extension and soil and water experts.

-- The state Farm Bureaus in North Carolina, South Carolina and Virginia initiated and helped pass state laws allowing tax credits for farmers who purchase conservation tillage equipment.

AGRICULTURAL RESEARCH

Finally, there is a pressing need for more agricultural research to answer many of the questions that will allow agriculture to be competitive in world markets and responsive to environmental concerns. The National Academy of Sciences Board on Agriculture recently proposed a $500 million competitive grants program within the USDA to revitalize agriculture. If given equal status with the other agencies within the USDA, these novel awards for agricultural ingenuity could go a long way in helping farmers cope with the increasing complexities of farming. We hope that Congress will give serious consideration to this proposal when it is presented.

We thank you for this opportunity to express our views. We appreciate your efforts and look forward to working with your committee.

Attachment to Testimony
American Farm Bureau Federation
June 22, 1989

INTEGRATED PEST MANAGEMENT: A NATIONAL PRIORITY

Integrated Pest Management (IPM) is a systems approach to safely reduce pest damage on crops while maintaining quality and yield goals. First the amount of injury which can be sustained by the crop without damaging yields is determined. This is correlated with pest density. Pest populations are then monitored in the field. Treatments are recommended only when pest populations rise above the predetermined thresholds.

A variety of techniques are utilized to keep pest populations below damaging levels. Permanent pest suppression can sometimes result through the successful establishment of predators and parasites, environmental modifications, changes in cultural practices, or the development of resistant crop varieties. In all cases, pesticides are used only when necessary and appropriate.

Currently, IPM programs are evolving towards a total systems management approach to farming. All of the variables that influence the development of the crop are considered: soil, water, light, microclimate, crop architecture, pests, diseases, etc. In some programs, farm economics are also taken into consideration.

IPM programs have been under development for the last 15-20 years. They have a proven track record in terms of saving the farmer money either by decreasing input costs or by improving the quality of the end product. IPM programs have reduced pesticide use considerably on some crops. Typically, fewer applications per season on fewer acres are now needed. But the potential reductions could be considerably more. The Office of Technology Assessment estimates that we could reduce pesticide use in U.S. agriculture by as much as 75 percent if IPM programs were widely adopted.

IPM programs are normally crop-specific and site-specific since pest complexes on crops vary from region to region. Estimates on the percentage of crops grown under IPM practices (when defined as the use of two or more tactics for pest suppression) show that large percentages of the apples, alfalfa, cotton and soybeans grown in the U.S. are under some form of IPM. But in general, the percentage of total cropland under IPM is probably closer to 25 percent.

HISTORY OF IPM

At the present time, the USDA is the lead agency in developing of IPM programs. Back in the late 1960's and early 1970's, the USDA and National Science Foundation, later joined by the newly formed Environmental Protection Agency, launched several national IPM research programs. In 1972, the Huffaker Project, directed by Dr. Carl B. Huffaker at the University of California at Berkeley, began with universities in 18 states and over 300 scientists participating. The six year project focused on insect control in alfalfa, cotton, soybean, citrus, pome and stone fruits, and pine forests (primarily bark beetles).

During the same period, funds were provided to the Cooperative Extension Service (CES) by the USDA to begin development of pilot pest management programs. From 1971 to 1975, 39 federally funded pilot pest management projects were started in 29 states by CES. The Cooperative Extension Service IPM programs were based on the use of field scouting to determine whether or not insecticides should be applied. Later CES programs included management of weeds, diseases, and nematodes, as well as insects. Today, virtually every state conducts an extension IPM program.

Following the Huffaker Project in 1979, a similar program was initiated by Dr. Perry L. Adkisson at Texas A & M University. The Consortium for Integrated Pest Management (CIPM) was made up of 17 states and involved over 250 scientists. It continued and expanded the use of systems study and modeling to better evaluate complex crop/pest interactions. CIPM focused on studying the effects and minimizing dam age of insects, weeds, diseases, and nematodes to four major crops: apples, alfalfa, soybeans, and cotton. It ended in 1985.

Recognizing a need for a national IPM approach, the USDA began considering how best to develop a coordinated framework in 1980. In 1982, the National IPM Coordinating Committee was established. The committee is made up of administrative and technical representatives from an alphabet soup of acronyms: the Agricultural Research Service (ARS), the Cooperative State Research Service (CSRS), the Extension Service (ES), the Economic Research Service (ERS), Consortium for Integrated Pest Management (CIPM), Regional IPM administrative advisors and chairpersons, and administrative representatives from the Experiment Station Committee on Policy (ESCOP), the Extension Committee on Policy (ECOP), and the Resident Instruction Committee on Policy (RICOP). Its current membership consists of representative Experiment Station Administrators, staff members from CSRS, and Department Heads from each of the regions. This committee oversees the national IPM program: four regional IPM projects working on 12 commodities, each directed by four regional committees (Miller and Clifford 1986). The four regions and the priority commodities included in the National IPM Program are:

West: range, alfalfa, small grains, tree fruits, potatoes
North Central: potatoes, corn, confined livestock
South: soybeans, cotton pecans, peaches, alfalfa
North East: potatoes, forage crops, tree fruits

In FY-1985 a total of 77 projects encompassing the 12 commodities were funded, adding up to about $2.8 million. Like most IPM research projects, the national effort suffers from inadequate funding and the uncertainty that accompanies "soft" money. Grants are renewed on a annual basis so that researchers do not know from year to year whether their project will be refunded.

ACHIEVING THE WIDESPREAD USE OF IPM

The widespread use of IPM among farmers will only be accomplished if we reestablish IPM as a national priority. Currently, IPM suffers from lack of funding and lack of well defined goals with research and technology transfer being parceled out among CSRS, ES, ARS, APHIS, and even EPA. The National Coordinating Committee is a step in the right direction but it is only a committee and lacks the statutory authority to insure adequate coordination between agencies and discourage "turf battles" among participants.

To develop, coordinate, and carry out a national strategy for IPM research and technology transfer, we propose the establishment of a new office within the USDA. This Office would report to the Assistant Secretary for Science and Education.

The Office of Integrated Pest Management (OIPM) would be given the responsibility to provide administrative support for developing and coordinating departmental policies and activities pertaining to IPM research. It would also carry out related interagency and public liaison staff functions. The OIPM would be specifically responsible for the following:

1. The OIPM would oversee the functions and activities of the IPM National Coordinating Committee.

2. The OIPM would assist in the development and implementation of policies as recommended by the IPM National Coordinating Committee.

3. The OIPM would maintain records of the IPM research and technology transfer activities carried out under the authority of the Secretary of Agriculture.

4. The OIPM would be responsible for coordinating activities with other federal agencies. Specifically, OIPM would work with EPA on registration of biopesticides and replacement control methods for canceled pesticides. OIPM would also work with NSF to help direct research at the National Centers for Excellence in IPM (see below).

In addition to the OIPM, we need to reaffirm our total national commitment to IPM. We can accomplish this by offering incentives to farmers to aid them in making the transition to IPM programs and by removing disincentives that discourage use of IPM techniques such as crop rotations and biopesticides.

The following recommendations are designed to improve IPM research programs, accelerate technology transfer to farmers and make IPM a national priority.

1). ACCELERATED REGISTRATION OF BIOPESTICIDES: We need a wider variety of highly selective, environmentally-sound, IPM compatible pesticides to increase the effectiveness of IPM programs. The registration of biopesticides such as pest disease agents, insect pheromones, and other alternative methods of pest control can be encouraged in a number of ways. These include the streamlining of registration procedures and the reevaluation of registration requirements.

2). **USE OF IPM BY FEDERAL AGENCIES:** All federal agencies, including the military, should adopt the most suitable IPM technology available on all lands leased or owned by the federal government. Agencies should use all fiscal, programmatic, and regulatory mechanisms to encourage the development of IPM in all sectors. Although required to do so back in 1972, there is some question as to how widespread compliance has been.

3). **SUPPORT OF RESEARCH AND DEVELOPMENT:** IPM programs are dependent upon the availability of qualified personnel, the adequacy of the data base, and the successful integration of that data into a workable system. The continued support of IPM research is vital. Examples of programs that should be encouraged include:

a). a national resistance monitoring system to identify pest resistance problems before they become widespread.

b). a national pesticide monitoring system to identify problem pesticides (pesticides likely to be withdrawn from the market due to environmental problems). Our greatest problem with canceled pesticides is the economic hardships caused by the lack of suitable replacements -- either alternative pesticides or economically viable alternative control tactics. If we can do a better job of pinpointing problem pesticides, we can get a headstart on developing alternatives. Industry-government projects should be encouraged in this area.

In addition to funding the above programs, funding agencies need to recognize the need for interdisciplinary research in IPM. Although funding of individual projects should continue, more funds should be directed towards group projects to encourage cooperation across departments and disciplines (for example, a joint project on strawberry IPM involving entomologists, plant pathologists, agronomists, weed scientists, etc.).

4). **IPM TRAINING:** IPM training should be incorporated into all pesticide applicator training programs. All commercial and private pesticide applicators should be aware of IPM tactics and the value of using chemicals judiciously. Incorporating this type of training into these programs would reach a majority of farmers.

There is also a need to educate loan officers about new management techniques. They are responsible for lending farmers money and, if unfamiliar with IPM, may require the farmer to continue to use conventional production management techniques.

5). **EXTENSION IPM PROGRAMS:** The Extension Service has recommended improvements in the following areas and we concur: 1) educating agricultural chemical dealers and sales personnel; 2) providing interdisciplinary training for extension IPM specialists; 3) involving consulting firms more directly to encourage rapid technology transfer; 4) developing interdisciplinary research teams to address problems; 5) providing more direct access to research results; and 6) placing more emphasis on the training of IPM scouts.

6). **EXAMINATION OF THE EFFECTS OF CONTRACTUAL AGREEMENTS ON IPM USE:** The excessive use of pesticides may be encouraged by the lending procedures used by banks making agriculturally related loans. For example, banks may require routine calendar spraying to protect their investment. In addition, the cosmetic standards set by the food marketing and processing industry may exceed those necessary for storage and to preserve taste and nutrition. Both possibilities should be examined and, if necessary, changes made.

7). USE OF CANCELED PESTICIDES WITHIN APPROVED IPM PROGRAMS: EPA should undertake an environmental risk-benefit study of the possibility of restricting high-risk pesticides to use within approved IPM programs. In other words, if a pesticide's safety or environmental effects are in doubt, then its use would be allowed only in IPM programs that minimize risk and maximize benefits.

8). IPM IMPACT STATEMENTS FOR PESTICIDE REGISTRATION: As part of the development process, companies should be encouraged to test novel pesticides within operating IPM programs early on in their testing programs. The registration process would favor those pesticides that have been proven compatible with existing IPM programs on the appropriate crops.

9). ESTABLISHMENT OF CENTERS OF EXCELLENCE FOR IPM: The National Research Council is recommending that the National Science Foundation establish regional Centers of Excellence for IPM. Researchers from many disciplines would be encouraged to interact and blend existing and developing technologies into workable IPM programs.

These centers will be especially important if we are to achieve the immediate and successful incorporation of products generated through agricultural biotechnology into IPM programs.

10). EXAMINATION OF THE EFFECTS OF FARM PROGRAMS ON IPM USE: We need to examine our farm programs to determine whether or not they encourage or discourage the use of IPM tactics. Program versus nonprogram crops can influence rotation practices. For example, the base acreage provisions in corn can influence crop rotation practices. Crop rotation is a very effective way to minimize recurring pest problems.

Senator FOWLER. President Kleckner, let me try to get up to the challenge that I just heard myself say. With all respect to everybody, it has been mentioned three or four times today about how LISA means different things to different people. I will acknowledge that, but what LISA means, will mean, is what the law says it will mean. It is what this bill says.

That is what we are talking about. That is what we have been working with you and your groups for 3 years on. It has been changed 27, 37, 47 different times, but this is what LISA is. It is not somebody saying, "We are going to take away all your chemicals." It doesn't say that. It does not say you have to throw away all your fertilizers. It doesn't say anything like that. Not an ounce of revolution in here, as you have heard me say before.

This is what LISA will be, if we pass it, if we put it in the farm bill as part of the conservation title, and after it has been amended on the floor and other suggestions, so there is not going to be any question about what the policymakers are talking about when we ask and give the farmers incentives to try, voluntarily. The only mandatory section in my bill is well water testing. Everything else gives encouragement, tries to protect the farmer's yield and, by extension, his profit.

This is what LISA is. This is what we want to try. It may not work, but we are here 24 hours a day, as you have seen. If not me, there would be another Senator from Georgia, and on and on. We review these things all the time.

But I do want to say, and I know you will take this with respect, it is not any fad. The one thing you can't accuse low-input of is being faddist or the latest fad. They had 3,000 years of tillage and conservation practice before they had any chemicals, when a farmer had to do something about his bugs and pests, and where he was going to get his water and how he was going to irrigate his crops. That is old as certainly the Nile River Valley and Mesopotamia.

I know there are some people who say, "Well, that's ridiculous," but the funny thing is, just like James Lee just said, you know, we have farmers in Georgia all of a sudden saying, "Hey, this works. It worked for my grandfather and now it is working. It is costing me less, and lo and behold, I have just as good a yield."

Now we all know there are different parts of the country, different crops, different climates, and no one is proposing to throw the chemicals out the window. I must say, with some of the chemical representatives here today, that they for the large part have been very helpful in going with us step-by-step and understanding and not just throwing up their hands.

But I choose you for my little speech, Mr. President, because you have the largest farm organization in the country. I know there are some people running around that don't want to change. My granddaddy farmer is just as obstinate and stubborn as anybody else. He thinks he knows exactly how to do things, and nobody can tell him anything, including some urban grandson. [Laughter.]

But as you heard us say before, the impetus of this isn't coming from Washington, believe it or not. We didn't just sit up here and say, "Hey, what are we going to do this week? Let's think up something." Lord knows we have enough to say grace over. I wish half of these things would go away.

But what is happening, as you see in every television program, every magazine, the old environmental issues have somehow magically revived, in the minds of the consumer and the farmer, saying "Why can't the Government guarantee that the food we eat and the water we drink is as free from contaminants as possible, as free from residues as possible?"

That is not going to go away, and whatever may have been usual or normal farm practices, that farmer who doesn't want to be sued and wants to know that his crop is going to go to market and not going to be rejected, is the one that is going to get ahead of this curve of health concerns and do everything in reexamining what he has been doing, but take advantage of all that you have heard from other witnesses that is going on and try.

What I am trying to do is let him try it without losing anything. That is LISA. We will try to think up something, change the words so it means "lose nothing by trying," because that is what we are going to let him do. We are going to protect his crop insurance, going to protect his base acreage, going to give him some financial incentives. We are going to help him pay for his well testing, going to go right down the road and do it.

But where I need, where we all need your help is to say this is what LISA is about, and we either do it, we either give it a try when it is voluntary, or all of a sudden we are going to be overrun. In some parts of the country, as the Secretary from California could already tell you—you heard what he said this morning—they have to register every chemical when they put it on the crop. If I proposed that this morning in Georgia they would have a recall petition out, but yet they are already doing it in some States.

Why is that? That is not because anybody wants to zap the farmer, or see how many chemicals are sold. That is because of the consumer health demands, that they want to know what is being put on the crop, in what quantities, and whether or not there are toxicity levels that cause problems.

Mr. **Kleckner**. Senator, just let me respond briefly.

Senator **Fowler**. Please.

Mr. **Kleckner**. I don't disagree with much of what you have said. My point is that there are many people out there that don't have the definition of LISA that is in your bill in their minds. To them, it is something else. It's a few chickens, a few ducks, it's a sow, a cow, 10 acres and a team of mules, and farming the way they farmed in the Mesopotamia River Valley 3,000 years ago.

That is not the way we can farm today, and I think we both know that—Senator Bond, and James Lee Adams, whom I know very well—so we are concerned about these people that think that way.

Senator **Fowler**. But that is an education problem. I don't want to interrupt you. That is simply an education problem. We can't accept the fact that they are going to make up their own definition of what we in the Congress and in the leading farm groups might do to them, when we are not. Nobody has proposed these horrifying stories that get around.

So our public responsibility, I say with great respect, both those of us who are elected and those of us who are elected leaders in the private community, is to educate by simply saying, "Nobody is talking about those things that you are defining. What they are talking about is very specific." We still may not pass it. I grant that.

Mr. KLECKNER. I understand.

Senator FOWLER. But we have to get away from this business of letting everybody define things their own way and making up scare stories that simply have no truth whatsoever, because there is not a single bill before the U.S. Congress that anybody has ever brought to my attention, and I have the committee jurisdiction, that says we are all going to back up the trucks and throw the chemicals in.

Mr. KLECKNER. I will conclude with this: Really I think what a lot of us are talking about is the things that we are doing in IPM, in integrated pest management, really reducing the chemicals. If we could just get a sexy name for it—you know, LISA, that's my daughter's name. We should call IPM "Ursula" or "Andrea" or something like that, and maybe people would really go for that. [Laughter.]

But that is what we are talking about, and that is what we are in favor of. That is what I am doing on my farm. I am cutting back on the usage of insecticides and herbicides from some years ago. James Lee I'm sure is on his farm at Camilla, Georgia, my farm in northern Iowa. Farmers want to do that. Poll after poll shows that farmers want to use less inputs of every kind.

I think what some of us haven't thought about yet is, we need also to maintain the output. If we can maintain the output, the profit, the bottom line—that is what we have heard today—with less inputs, we will move that way in a minute. We still haven't gotten that convincing job done yet, in my opinion.

Senator BOND. Mr. Chairman, I was just going to add a few thoughts. First, I commend you for your commitment to the concept of LISA, but when you tell me that there is not going to be any risk for trying new things, I really think that you can't take the risk out of farming. We have a responsibility to encourage and support movements toward better management practices, to much more environmentally sound practices, and even our best government programs cannot take the risk out. Our hope is that they don't put too much risk in.

As we move forward, the educational process you describe is a very important one, because we ran into people in Platte City, Missouri who had an instant, violent reaction to the term "LISA," if you will remember. They are concerned about it.

I think there is a lot of education we need to do, both for farmers for better environmental practices, and really some of the environmental practices may not involve chemicals. One of the things that we haven't had time to discuss today is what is the danger of using natural fertilizers, animal waste, and the leaching of nitrogen? It is not just synthetic or chemical problems that we have to deal with in all of agriculture.

But we also, I think, have a responsibility in this committee to help carry the story to the consumers of this country who have been subjected to food terrorism, scare stories that have not been based on sound information, who think that we do not have a safe food supply, who are concerned about chemicals but who don't really know the story of how we are getting a better handle on these practices.

I think part of the messages we are getting today are about some very exciting things in agriculture, and I maintain, as I did in questioning to the panel earlier, that a good farmer is by definition not only a farmer but an environmentalist and a conservationist. If he or she is not, then that person is not a good farmer in my book. I think that part of our education needs to build on what we have seen, what we have heard about today, and try to incorporate a better understanding both of the consuming public and of agriculture.

Thank you, sir.

Senator **FOWLER**. Thank you, Senator Bond.

Mr. Tonsager, we haven't forgotten about you.

Mr. **TONSAGER**. Oh, thank you. I appreciate that.

Senator **FOWLER**. Let me offer my apologies. The Majority Leader just called me. We are doing this child care bill. I have to run over to the floor for 10 or 15 minutes, but since I am bred on bipartisanship and have such great trust in the Senator from Missouri, I am going to do what I am not supposed to do and turn over the gavel to a Republican, and ask his indulgence if he can be here for another 10 or 15 minutes.

Senator **BOND**. I can stay about 10, but I was supposed to get over there, too, but I will stay here for 10 minutes and get the next panel started.

Senator **FOWLER**. Thank you. If I am not back, then we will just recess until I get back, if you have to go.

Senator **BOND**. All right, sir.

Senator **FOWLER**. Thank you, Mr. Tonsager.

STATEMENT OF DALLAS TONSAGER, PRESIDENT, SOUTH DAKOTA FARMERS UNION, ON BEHALF OF THE NATIONAL FARMERS UNION, OLDHAM, SD

Mr. **TONSAGER**. Thank you very much.

INTRODUCTION

My name is Dallas Tonsager. I am president of the South Dakota Farmers Union. I am here today representing the National Farmers Union, an organization of a quarter of a million family farms across the United States. Also I live and farm in South Dakota, near a small town.

My organization, we have been in town the last few days with a group of about 140 people, going around talking specifically about this issue, and our concern with it and our commitment to the environmental community, and the belief that we have a major responsibility as farmers and a real interest as people. I guess I want to spend my time just talking as a farmer, by and large, about this issue. You have a copy of our written testimony. I am sure that will be included.

FARM POLICY

You know, I am a farmer and a father, and I am person who deals with intensive use of chemicals and fertilizer all the time. Farmers by nature respond to their environment. They are doomed to that, I believe, in that they live within the policies and they live within the environment and the weather and the other related problems.

One of the major things we want to begin with in talking about this issue is farm policy in general. We believe that the best policy for improving the environment is a farm policy that allows to farm and live and continue to farm in a less intensive way, if possible. We believe that the current farm policy gears itself toward extremely intensive practices, and that to some degree also we have begun to technologicalize ourselves to death.

We have invested great amounts of money through various mechanisms to develop new technologies which we support and use, but those technologies have expanded production dramatically and have resulted in a reduction in the number of farmers, which ultimately is an ongoing cycle. We work hard to do everything better, which in turn means there need to be less of us, so in a way we are working against ourselves. We would like to begin with the farm policy, and hope that when the farm policy is developed, that it focuses on making sure that we as individuals have the opportunity to stay out there and use that technology that we are helping to develop and to be part of that program.

IN FARM POLICY WE LOOK AT THE GATT NEGOTIATIONS GOING ON IN EUROPE

Also, in farm policy we look at the GATT negotiations going on in Europe. You know the stated purpose of our Government and the GATT negotiators is to bring about the elimination of farm programs, the elimination of farm programs worldwide. We have proceeded the last 5 years to tie sodbuster and swampbuster and every other program that is environmentally sound to the farm program. By nature, as we begin to eliminate programs, we begin to eliminate the incentive to participate in those. If that is the stated policy in the next decade, to eliminate the farm programs, then we will eliminate much of what we have done in the last decade as far as improving our environment, so we get concerned when the GATT discussion goes down that road.

WE, OF COURSE, SUPPORT LISA AND THE DEVELOPMENT OF THOSE PROGRAMS

We think it is important that we keep perspective. We, of course, support LISA and the development of those programs. We think they are critically important, that we can continue to look at that, but we think we need to deal with current technologies here and now, and how we use the things we have and the best possible methods.

I am very proud of a cooperative that our organization helped form many decades ago, called CENEX, in the Upper Plains. They have a program called Centrol, which is specifically designed to help farmers use chemicals and fertilizers at their best or most optimum use. That is what we discussed earlier, and we believe that is a here and now thing. We believe that is something we have to do, is use things properly and correctly.

GETTING INTO ROTATION WITH LEGUMES

We also believe that, when we get into some of the other solutions when we develop a new farm bill, we have to talk about getting into rotation with legumes again. I know as a child on our farm we had a significant amount of legumes raised, sweet clovers, alfalfas. As we have become more intensive, they have pulled out of the cycle, generally speaking, and we don't use as much of them. They are nitrogen fixing, very good for the soil, and we hope that in the farm program we find a way to encourage that back into the rotation because we think that is a very important area.

THE DEVELOPMENT OF TREES AND SHELTERBELTS ON CRP LAND

Another area I know a Senator, a friend of mine from South Dakota is interested in, and that is in the development of trees and shelterbelts on CRP land. I know he is considering that as an option in the future, in the next farm bill.

THE CLEANUP OF UNUSED CHEMICALS

Also I think another area that could be useful in the environmental area is the cleanup of unused chemicals. I know in Illinois there was a major program here a few years ago that brought about a voluntary pickup of major quantities of unused chemicals, and we are going to do that in South Dakota as well. There is a tremendous amount of that, and much of that chemical unfortunately, I think, will end up buried in a hole in the ground somewhere unless we dispose of it properly.

DEVELOPING A REGIONAL GROUND WATER AND ENGINEERING MANAGEMENT FACILITY AT OUR UNIVERSITY

Also in our State we are looking at developing a regional ground water and engineering management facility at our university there. We think we need to develop the expertise in how to deal with major ground water problems as they develop and how to prevent them.

GROUND WATER TESTING PROGRAM

Finally, of course, the ground water testing program that Senator Fowler is proposing, we are supportive of. We do not know whether it should be mandatory or voluntary yet, but we are discussing that issue. We do hope that it comes about. We need a baseline about our ground water. If there is a problem there, we need to face it.

I would like to thank the subcommittee for their time, and thank you very much.

[The prepared statement of Mr. Tonsager follows:]

NATIONAL
FARMERS
UNION

TESTIMONY OF

DALLAS TONSAGER, PRESIDENT
SOUTH DAKOTA FARMERS UNION

on behalf of the

NATIONAL FARMERS UNION

before the

Subcommittee on Conservation and Forestry
Senate Committee on Agriculture, Nutrition, and Forestry

June 22, 1989

600 Maryland Avenue, S.W. • Suite 202 • Washington, D.C. 20024 • Phone (202) 554-1600

TESTIMONY OF DALLAS TONSAGER, PRESIDENT, SOUTH DAKOTA FARMERS UNION ON BEHALF OF THE NATIONAL FARMERS UNION, JUNE 22, 1989.

Thank you, Mr. Chairman. My name is Dallas Tonsager, and I'm here this morning on behalf of the National Farmers Union, a general farm organization serving nearly 300,000 farming and ranching families in 26 states. I appreciate the opportunity to be here today to share some of our general ideas concerning conservation issues for the 1990 farm bill.

We are dealing with a subject that involves an ever-changing combination of environmental, social, ethical, cultural and even religious values, not to mention some very real and often overriding economic values. These values frequently create conflicting responses to the issue of stewardship. It is not just a struggle between conservation and economics, or stewardship and production. It is a choice of value systems. As a producer, I have to make these choices every time I make a farm management decision. The choices are not easy, and I am not always pleased with the end result.

Some view farming as strictly a business. For them, it is easy to separate economic decisions from environmental and social decisions. Farmers Union understands that farming is a business and must be managed within the economic framework of national and worldwide conditions. But, we also view farming as a way of life. We view rural America as our home, as well as our business headquarters. We view farming as a profession, and believe we have certain responsibilities within our profession to the rest of society.

Part of our professional responsibility is to be stewards of soil and water resources. We know that it is in our own best long-term interests to maintain and improve the productivity of our land. We want to be able to turn over our land to our children and the generations to follow -- and we want the land to be as productive for them as it has been for us.

Yet, we frequently have found ourselves forced to make short-term decisions that are not in our long-term interests. Unfortunately, we have been living in a time in our nation's history when short-term economics rule our daily choices. We are living in a time in which it is our national policy to produce more food with fewer farmers, for export at lower prices, to compete for markets that will allow us to produce more food, and the cycle continues.

Producers have been placed on a continuing cost-price squeeze. It has become an economic treadmill that has little regard for the long-term consequences to the structure of agriculture, to rural society, to future agricultural productivity or to the environment. We are now faced with the challenge of drafting new farm legislation that will continue to provide a safe, stable, low-cost food supply, while also rebuilding rural America and addressing increasing concerns over the environment.

In his testimony before the full Committee on April 19, Agriculture Secretary Yeutter correctly noted that the 1990 farm bill must devote considerable attention to environmental issues and that the Food Security Act of 1985 made a good start in the area of soil conservation. Farmers Union supports the goal of reducing soil losses to tolerable levels through such tools as cross-compliance, sodbuster and swampbuster restrictions, and the opportunity for long-term land retirement in the Conservation Reserve Program (CRP).

The CRP has been successful in removing millions of acres of highly erodible land from production. Farmers Union believes that CRP eligibility should be expanded to accommodate other types of environmentally fragile land. For example, CRP could be used as a last resort for land on which the soil type is too sandy to allow any type of chemical use without leaching into groundwater, and for which non-chemical alternatives aren't feasible. CRP might also be used to protect wetlands. Since CRP is well within the original 45 million acres, we do not believe that it is necessary to increase the overall or per county acreage caps at this time.

We are deeply concerned about Secretary Yeutter's statement to the effect that we should look for alternatives to the CRP because of its cost and our current tight supplies. Farmers Union believes that land currently enrolled in the CRP should not have been farmed in the first place and, like many others, we would be slow to endorse a plan to bring that land back into production. Tight supplies this year are the result of a drought last year, not some long-term change in American agriculture's ability to overproduce. On the question of cost, there is really no basis for comparison unless one can estimate the "value" of our soil resources. Even though CRP has rewarded those producers who failed to use good stewardship when they broke up highly erodible land, Farmers Union believes that payments made under CRP contracts have been good investments -- provided that the land stays in some soil-conserving use when the contract expires.

There are any number of creative ways to deal with land that will be coming out of CRP in the next few years. Anything, from establishing a youth conservation team to give rural young people summer jobs planting trees, to breaks in establishing commodity bases for beginning farmers who agree to leave CRP land in conserving uses, to even providing estate tax incentives for long-term easements, is worth exploring.

The sodbuster provision of the Food Security Act of 1985 was largely in response to the abuse of farm price support and farm credit programs, as well as soil resources. In the boom years of the 1970's, there were land developers and speculators who would purchase vast tracts of grassland, convert it to cropland and establish a commodity base for that new acreage. They profited handsomely from increased land values, federal farm program payments, and our nation's tax laws. Yet, it was totally counterproductive to the credibility of soil conservation efforts and to federal commodity and credit programs.

While we have always supported soil conservation education, we have consistently taken the second step, and also urged a level of cross-compliance between farm program participation and soil stewardship practices. Farmers Union renewed that commitment last year when we advocated maintaining alternative conservation systems only as a tool available to local officials in exceptional cases, rather than an option provided as a matter of course. The general rule should be to strive to reduce soil losses to tolerable levels (T). We believe the best answer is to give local authorities, through our Soil Conservation Districts and our ASCS committees, the ability to make some judgments, both in terms of temporary exemptions and in cases of inadvertent failure to comply.

We believe that conservation cross-compliance is necessary as part of an implied contract that we, as food producers, should have with consumers. The social contract should be that farmers produce food in a manner consistent with good stewardship of soil and water resources. In return, we believe that consumers should help pay for soil and water conservation measures as part of food costs.

We have accepted this principle to some degree in energy development. The agricultural, social, and economic costs of energy development must be considered an energy production cost. We pay for clean air when we pay our utility bills and part of the money goes to the cost of pollution control equipment. It shouldn't be any different when we buy food. The cost of a loaf of bread should help cover soil conservation practices used on the land that produced the wheat. The cost of a quart of milk should help cover the cost of manure management practices used by the dairy farmer to keep nitrates from leaching into the groundwater.

There should also be a renewed financial commitment on the part of taxpayers. As we move into the conservation plan implementation stage, the need for a fully staffed and funded Soil Conservation Service (SCS) is becoming crucial, as is the need for cost-sharing conservation measures. We urge the Committee to preserve the role of the SCS employees as helpful technical advisors, and not "program police." The number of environmental challenges and farmers' needs for information have never been greater. We cannot afford to risk the relationship of trust that has grown over the years between farmers and the SCS.

The 1985 conservation provisions were a good first step, but the time has come to move beyond a separate title tucked in the back of a bill toward making commodity programs more compatible with our environmental goals, both for soil and water. We believe that Secretary Yeutter correctly described the problem to you, but we absolutely disagree with his proposed solution. It doesn't make sense for commodity programs to require farmers to set aside some of their acreage, and then pay them according to how much they can possibly produce off the remainder. We shouldn't set up programs that discourage crop rotations. But decoupling is not the answer. Decoupling farm program payments from commodity production will take billions out of the farm economy by forcing prices lower, and will require farmers to produce more in order to meet fixed costs. Farmers will overproduce on all of their land instead of some of it, collectively driving prices still lower. When an individual farmer couldn't expand anymore and dropped out, his land would be purchased by another still-expanding farmer and kept in production.

What makes the cross-compliance, sodbuster, and swampbuster provisions effective -- and even Secretary Yeutter hails them as a major advancement -- is the fear of losing program benefits. If program benefits are removed anyway, we are virtually guaranteed that marginal lands will be kept in production. In addition, the options for new stewardship incentives are substantially diminished.

Farmers Union believes that a far better alternative to decoupling is to work within existing programs, and we would recommend three basic areas of change. First, simply making payments based on units of production instead of acreage would not only allow USDA to predict program costs with a greater degree of certainty, it would also allow farmers to farm using crop and field rotations that make sense for their operation. Being paid a fair price on a specified amount of production would allow farmers to lower their variable costs by using more of their fixed land assets.

A second change would be to allow producers a one-time opportunity to prove actual yield. This would attract higher producers into the program, and therefore into cross-compliance.

Third, farmers should be able to enter into long-term rotations with such crops as alfalfa or legumes without violating sodbuster requirements and without losing base in their primary commodity. Along this line, we would support multi-year set-asides to allow time to establish vegetative cover crops.

While water protection has generally been left to the states through the Clean Water Act and other water quality legislation, we believe that the federal government can help. We support setting a national water quality policy with the following goals: to establish the protection of groundwater resources and health of those who rely on groundwater for drinking water as national priorities; to identify areas in which information is lacking; to establish a balanced approach of incentives for better water stewardship and penalties for water pollution; to recognize the appropriate role of state governments in protecting their citizens; and to provide states with adequate resources to enforce water quality initiatives.

We hope that President Bush's commitment to water quality includes the necessary commitment to research and education funds. It is time for agriculture to address the role it plays in contributing nitrates and pesticides to our groundwater supplies, but there is still too much we don't know about such issues as how chemicals travel through soil and what can be done to clean up groundwater once it is polluted. With the vast majority of rural residents relying on groundwater for their primary source of drinking water, farmers generally are very concerned about the impact of their farming practices on water quality. But, many of our members have expressed concern that they not be penalized for past practices which, while normal and acceptable at the time, have since been shown to cause problems. We need the research and outreach to farmers that will allow for a balance between incentives and penalties, conservation goals and production needs.

Closely related to the need to identify the impact of current practices is the need for research into low input and non-chemical alternatives for pest management that can reduce the amounts of poisons introduced into our environment. Unfortunately, as federal research dollars have been drying up, land grant universities have relied more heavily on grants from chemical manufacturers.

We need to develop practical low-input and non-chemical alternatives for more commodities, not just to protect groundwater and lower farm input costs, but to decrease the potential for pesticide residues remaining in our food. Secretary Yeutter correctly reported at the April hearing that American consumers are worried about the safety of their food supply, and much of that is due to pesticides. As advocates for American agriculture, we should all address consumer concerns, not just by telling them that their food is safe, but by showing them what we're doing to make sure the food supply is safe. For example, Mr. Chairman, we supported your amendment to last year's Federal Insecticide, Fungicide and Rodenticide Act which would have helped to address the outrageous practice of exporting pesticides banned in this country only to import food products produced with those chemicals. Farmers Union also strongly supports increased levels of inspections, particularly on imported foods. We need a fully staffed Food Safety and Inspection Service. We need close cooperation among USDA, the Environmental Protection Agency and the Food and Drug Administration. We need a farm bill that demonstrates a commitment to sustainability -- of safe and nutritious food supplies, of natural resources, and of the agricultural production system that has promoted them both -- family farms.

Throughout much of the late 1970's and early 1980's, many family farmers were told to "get big or get out." Small and mid-size diversified farms were considered inefficient, and the country saw a rapid increase both in farm size and in commodity specialization. Yet, capital-intensive agriculture requires a greater dependence on chemical fertilizers and pesticides. At the same time, long-standing conservation practices such as shelter-belts and windbreaks were torn up to make room for larger equipment to operate. Farmers Union believes that, in many respects, the agri-factories we see today have passed the point of maximizing economies of scale. It is time to define "efficiency" in terms of total resource use and recognize that truly efficient producers do not squander soil and water resources.

Thank you again for the opportunity to present our views. I would be happy to answer any questions you might have.

Senator **Bond** [presiding]. Mr. Tonsager, you have touched on many things that are before this committee, and certainly I share the interest in developing more tree planting and forests on CRP land. We are going to be looking at ground water. We have taken some major steps in dealing with chemicals in FIFRA, even though it was FIFRA light that we dealt with last year.

I would disagree with some of the implications of your statement about GATT, that GATT is designed to eliminate farm programs. I really don't think that is the case. I think we are talking about eliminating trade-distorting subsidies or barriers to farm programs, and certainly marketing loans in a free, fair market would be a trade-distorting subsidy.

Nevertheless, we still have conservation programs like CRP. I expect that no matter how successful we are, we are not going to get rid of disaster programs, whether it is an improved crop insurance program or a better disaster relief program. We are going to be considering that later this year, so as much as some would like this committee and the USDA to go away, even if we are totally successful in GATT negotiations, I don't think that will happen. I think that there will be a continued push, not only for research and education but positive incentives for conservation practices.

Dean, on page 6 [2] of your testimony you raised concerns about promoting multiyear set-asides. That is an idea that came out of a bill that I introduced last year. I want to emphasize that it is a voluntary program and it is one that you could buy out of. I think it is an important option, and I look forward to working with you. We would like to include something like that in the farm bill because there are tremendous conservation potentials with it, but I think there are certain voluntary aspects and options that could be included.

Mr. **Kleckner**. Senator, I think our concern is, the indications are that, with the demand for food and agricultural products increasing in the world and our competitiveness now, that we may need some of these acres. If they are tied up——

Senator **Bond**. Better they be in a 3-year set-aside than planted for trees in CRP. I don't think that there is any way—personally, I don't think we are going to be able to go another 10 million acres in CRP. I think it is getting too expensive, and I think that we are really beginning to push up against those limits.

Mr. **Kleckner**. That was our concern, that if you tie it up long term, and perhaps a buy-out, a buy-back some way, we needed to get the conservation aspects in CRP. We have most of those bad acres now already out in the 30 million but, as you pointed out, to get to the 40 or 45 without some changes, the cost, farmers are saying no, beginning to say no more often than they did when we first started that.

Senator **Bond**. I want to ask Mr. Klor or Mr. Adams if you have any final comments you want to add on all of these things.

Mr. **Adams**. I appreciate the opportunity.

Mr. **Klor**. Exactly. Thank you.

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[2] See p. 140 for page 6 of Mr. Kleckner's prepared statement.

Senator BOND. Thank you very much, gentlemen. We very much appreciate and will certainly take into consideration your entire written testimony.

We invite the members of panel 3 to come forward.

Our first witness on this panel is Mr. Dave Williams, a farmer from Villisca, Iowa, which he tells me borders Missouri. It's amazing how we are beginning to get closer to the Midwest now as we move along. He is on the Sierra Club Agriculture Committee and chairman of the District Soil Commission. Mr. Williams.

STATEMENT OF DAVID L. WILLIAMS, MEMBER OF THE SIERRA CLUB AGRICULTURE COMMITTEE, ON BEHALF OF THE SIERRA CLUB, VILLISCA, IA

Mr. WILLIAMS. I wanted to say it to Senator Fowler, but he is not here, so Senator Bond, I say to you our county borders Missouri, and in our Soil Conservation District we are doing a joint watershed project with Missouri in the Tarkio area, Iowa/Missouri. It is a joint project, and we are very excited about that.

Senator BOND. Up by Atchison County? Good. Well, we are working on some of those, and we will be glad to help you.

INTRODUCTION

Mr. WILLIAMS. I am also a hog and grain farmer from Iowa, as is Dean Kleckner. I don't know whether he left or not. I just wanted to say to Dean, one of his comments, I think as he has trouble defining LISA, I have somewhat too, but I think also each of us could have just as much trouble defining or saying what best management practices are, also. I wanted to get that comment in.

I am here on behalf of the Sierra Club, and I also am chairman of our district soil commissioners, so I am quite knowledgeable on that also.

I actively farm in a partnership with my son, Bruce, in a diversified livestock and grain operation in southwest Iowa. My ancestor's farm, which I worked with my brother for 14 years, was named the outstanding Iowa conservation farm a few years ago. I am very proud of that. We practice many conservation measures, with a goal to leave the land better than we found it and to have given our children an appreciation for the land and nature. Our farm is both progressive and profitable.

My father built the first terraces that were built in our part of the State, some of the first in the State. I have a son now working in Central America in a reforestation and soil conservation project, so if Mr. Goldsmith was still here, he would be interested in that.

I am a member of the Sierra Club Agriculture Committee which is an active participant in the Sustainable Agriculture Working Group, a group of environmental and farm organizations formed to develop policy options for the next farm bill. My views today are consistent with these groups' positions. Though the overall goals of the groups vary somewhat, they are united by their concern that Federal policies need to encourage low-input techniques that nurture family farms, save energy, and protect soil, water and other natural resources.

When I say low-input, that does not mean no input. I told somebody the other day, on our 590 acres we apply some form of fertilizer on almost every acre, but this is where I think I can qualify on best management practices.

I am humbled by the topic of conservation, but I have a great concern and an intense interest in this most important topic. The World Book Encyclopedia defines conservation as the protection and wise use of our environment. Since conservation is a broad field, I will limit my remarks to conservation of the land, specifically as it applies to sustainable agriculture and S. 970.

SUSTAINABLE AGRICULTURE DEFINED

Sustainable agriculture has been defined—I don't know whether Dean Kleckner left, but here is a good one—as "The appropriate use of crop and livestock systems and agriculture inputs supporting those activities which maintain economic and social viability while preserving the high productivity and quality of our land." Sustainable agriculture maintains the soil and natural resource base, improves and promotes family farming and our farm communities, produces quality food, and protects human health. In practical terms, this means reducing soil erosion, improving our ground water and food quality, and enhancing everyone's quality of life.

FARM CONSERVATION

Senator Bond, this is my fourth appearance before a Senate hearing on farm conservation. I reviewed my previous statements, and each one still applies to the conservation issues of 1989. The serious abuse of land has continued since I first testified in 1976 at a hearing sponsored by Senator Dick Clark.

In 1975, some years ago, Iowans learned they had lost one-half of the topsoil in the first 100 years of farming. It takes centuries to produce an inch of topsoil. The current economic value of lost Iowa soil is greater than the cash value of corn harvested in our State. Obviously, this sort of loss cannot continue without bankrupting farmers and the Nation.

OUR AREA HAS SOME OF THE MOST HIGHLY ERODIBLE SOILS IN AMERICA

I live in southwest Iowa, which borders the corners of Missouri, Kansas, Nebraska, and this is targeted as one of the most erodible soils in America. It is said that we lose 2 bushels of soil for every bushel of corn produced, and I have worked hard to reduce this rate on my farm.

Much land in the fragile rolling hills of this four-State area has been planted to a corn/soybean rotation in recent years. Only 15 years ago, farmers rotated pasture and cover crops. Senator Bond, I have been driving back and forth to Kansas City now for some 14 or 15 years, many times a year, and I have seen those pastures broken up, and some of the most serious erosion I have seen.

In fact, right at this time I wish everybody here could take a tour. There were some heavy rains in the area from Kansas City to Savannah, Missouri, and I will tell you there is 20 to 30 tons of soil loss in this area. It would blow your mind. We can't continue this type of practice.

I go on to say this practice is now discouraged by the commodity price structures. This should be changed.

WIND EROSION IS ALSO A MAJOR PROBLEM—SHELTERBELTS AND WINDBREAKS COULD BE A SOLUTION

You also know that just recently we saw lot of publicity on the wind erosion. On March 14, 1989, the Soil Conservation Service in Kansas reported the second worst wind erosion recorded on the Great Plains. In Kansas alone the wind damaged over 5 million acres of land and destroyed over 500,000 acres of crops. This is where shelterbelts and windbreaks could be a solution.

IMPORTANT THAT WE MAINTAIN AND STRENGTHEN THE CONSERVATION TITLE OF THE 1985 FARM BILL

Being a district soil commissioner, I have been intimately involved with reviewing conservation plans under the Food Security Act of 1985. We also review highly erodible land (HEL) that has been placed in the 10-year Conservation Reserve Program (CRP). These two things have been very successful, but more is needed. It is important that we maintain and strengthen the conservation title of the 1985 farm bill. To do this we could: expand the CRP acreage to permit additions beyond 45 million acres; encourage shelterbelts, field windbreaks, contour grass strips, and other special uses; permanently acquire easements on highly erodible land; reinstate the soil loss tolerance or T; require CRP lands coming out of contract to meet the soil loss tolerance; support tree planting on CRP lands; and increase the citizen participation with third-party appeals for swamp and sodbusting.

PERMANENT PRACTICES ALSO SHOULD BE FUNDED AT A HIGHER AMOUNT AT THE STATE LEVEL

Permanent practices also should be funded at a higher amount at the State level. We need to continue to target these conservation practices to our more erodible soils. We need a long-term—and this is something I heard somebody else say here, short-term, but we can't stand for short-term gains—we need to look at the long-term gain.

I ALSO HAVE GRAVE CONCERNS ABOUT THE IMPLEMENTATION OF THE 1985 FARM BILL

I also have grave concerns about the implementation of the 1985 farm bill. In May of 1988, SCS Chief Wilson Scaling ruled that Alternative Conservation Systems will be available to every producer on all highly erodible land soils irrespective of economic consideration or producers' ability to comply with tougher rules. This ruling seriously erodes the credibility of the conservation compliance section of the 1985 farm bill and should be changed in by congressional mandate.

Senator **Bond**. Mr. Williams, if you could wrap up, we will take your whole statement as if read.

Mr. **Williams**. OK. Let me just highlight a couple of things here.

CONCLUSION

It bothers me when farmers are pitted against environmentalists. Somebody else said this. Who more than farmers should be environmentalists?

I am also excited about what is being done at my own college, Iowa State. They have established the Leopold Center for Sustainable Agriculture, and just recently named a new director for the Soil Tilth Laboratory. These signs are very encouraging. Also, our extension I think is doing a very good job.

Senator **Bond**. Thank you very much, Mr. Williams.

Mr. **Williams**. Can I have a conclusion, my very last paragraph?

Senator **Bond**. I wanted to get the testimony of these two gentlemen, and I have to get out of here at 11:45.

Mr. **Williams**. OK. I have one paragraph.

As Aldo Leopold said in his chapter on land ethics in "Sand County Almanac":

> We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong we may begin to use it with love and respect.

Thank you.

[The prepared statement of Mr. Williams follows:]

CONSERVING FARMLAND AND NATURAL RESOURCES IN THE 1990 FARM BILL

TESTIMONY OF DAVID L. WILLIAMS
OF THE SIERRA CLUB

BEFORE THE SENATE AGRICULTURE COMMITTEE
SUBCOMMITTEE ON CONSERVATION AND FORESTRY
ON CONSERVATION AND AGRICULTURE PRACTICES

JUNE 22, 1989

Senator Fowler and members of the Committee, my name is David L. Williams and I appreciate the opportunity to speak with you today on behalf of the Sierra Club for increased conservation programs in 1990 Farm Bill. I actively farm in a partnership with my son, Bruce, a diversified livestock and grain operation in southwest Iowa. My ancestor's farm which I worked with my brother for fourteen years, was named the outstanding Iowa conservation farm a few years ago. We practice many conservation measures with a goal to leave the land better than we found it and to leave our children better off than we were.

I am a member of the Sierra Club Agriculture Committee which is an active participant in the Sustainable Agriculture Working Group, a group of environmental and farm organizations formed to develop policy options for the next farm bill. My views today are generally consistent with these groups' positions. Though the overall goals of the groups vary somewhat, they are united by their concern that federal policies need to encourage "low input" techniques that nurture family farms, save energy, and protect soil, water and other natural resources.

I am humbled by the topic of conservation but I have a great concern and an intense interest in this most important topic. The World Book Encyclopedia defines conservation as the protection and wise use of our environment. Since conservation is a broad field, I will limit my remarks to conservation of the land, specifically as it applies to sustainable agriculture and Senate Bill 970, The Farm Conservation and Water Protection Act of 1989.

Sustainable agriculture has been defined as, "The appropriate use of crop and livestock systems and agriculture inputs supporting those activities which maintain economic and social viability while preserving the high productivity and quality of our land." Sustainable agriculture maintains the soil and natural resource base, improves and promotes family farming and our farm communities, produces quality food, and protects human health. In practical terms, this means reducing soil erosion, improving our ground water and food quality, and enhancing everyone's quality of life.

This is my fourth appearance before Senate hearings on farm conservation. I reviewed my previous statements and each one still applies to the conservation issues of 1989. The serious abuse of land has continued since I first testified in 1976 at a hearing sponsored by Senator Dick Clark.

In 1975, Iowans learned they had lost one half of the top soil in the first 100 years of farming. The current economic value of lost Iowa soil is greater than the cash value of corn harvested in our state. Obviously this sort of loss cannot continue without bankrupting farmers and the nation.

I live in Southwest Iowa which borders Northwest Missouri, Northeast Kansas and Southeast Nebraska and has some of the most highly erodible soils in America. It is said that we lose two bushels of soil for every bushel of corn produced and I have worked hard to slow this rate on my farm.

Much land in the fragile rolling hills of this four state area has been planted to a corn-soybean rotation in recent years. Only fifteen years ago, farmers rotated pasture and cover crops. This practice is now discouraged by the commodity price structures. This should be changed.

Wind erosion is also a major problem. On March 14, 1989, the Soil Conservation Service in Kansas reported that wind erosion damaged nearly 5 million acres of land and destroyed over 500,000 acres of crops or cover in Kansas. Shelterbelts are but one solution to this problem.

Being a District Soil Commissioner, I have been intimately involved with reviewing conservation plans under the Food Security Act of 1985. We also review highly erodible land (HEL) that has been placed in the 10 year Conservation Reserve Program (CRP). This program has been very successful in protecting the soil on the acres enrolled. But more is needed. It is extremely important that we maintain and strengthen the Conservation Title of the 1985 Farm bill. To do this we must:

o Expand the CRP acreage to permit additions beyond 45 million acres.

o Encourage shelterbelts, field windbreaks, contour grass strips, and other special uses.

o Permanently acquire easements on highly erodable land to protect our great gains made by the 1985 Farm Bill.

o Reinstate soil loss tolerance or T as an objective of the Conservation Compliance Program to stop the weakening Alternative Crop Systems now being applied by the Soil Conservation Service.

o Require the CRP lands coming out of contract at the end of the 10 year contract meet the soil loss tolerance standard.

o Support tree planting on CRP lands with permananent easements.

o Increase the citizen participation with third party appeals for swamp and sodbusting.

Permanent conservation practices should also be funded at a much higher amount at the state and the federal levels. We need to continue to target these conservation practices to our more erodible soils. We need a long term commitment from farmers, citizens, and government at all levels for the conservation of our soil and water.

I also have grave concerns about the implementation of the 1985 Farm

Bill. In May of 1988, SCS Chief Wilson Scaling ruled that Alternative Conservation Systems will be available to every producer on all highly erodible land soils irrespective of economic consideration or producers' ability to comply with tougher rules. This ruling seriously erodes the credibility of the conservation compliance section of the 1985 Farm Bill and should be changed in by Congressional mandate.

Without bold steps like these, the soil losses will continue and our progress will disappear like sand in the wind. As former Governor and U.S. Senator Gaylord Nelson said to the question, "What in the long range is the most important issue facing mankind?"--

> "Right now and in the long haul into the next century and the centuries thereafter no other issue is more relevant to the physical quality of life from the human species than the status of our resources and the quality of our environment."

It bothers me when farmers are pitted against environmentalists. Who more than farmers should be an environmentalist? I try to be both and I think U.S. Farm policy should encourage other farmers to do the same. But the farmers need the information and it is hard to get. There have been improvements in our land grant universities over the past few years. Many have established sustainable agriculture programs like the one at I am most familiar with at Iowa State University. ISU has established the Leopold Center for Sustainable Agriculture and just recently named a new director for the Soil Tilth Laboratory there. A major goal of this U.S.D.A. center will be to promote sustainable agriculture. These signs are encouraging.

Cooperative Extension Service and Iowa State University are placing a greater emphasis on conserving and managing natural resources. I am particularly impressed with this commitment. This will lead to an increased development of a conservation ethic among the farm community and the general public and increase public involvement in natural resource isues. Unfortunately, many farmers from around the country tell me that their university systems are not so enlightened.

Picture our planet Earth for a minute. Thirty percent of the Earth is land. The balance is water. Much of the land is too hot, too cold, or too wet to grow crops. As a result the world has less than .9 of an acre of cultivated land per person to provide food for its 5 billion people. And the stress and requirements on this .9 acre will continue to increase as the world population of the world does--it has more than doubled in my lifetime. We as farmers and policy makers must practice agriculture that will keep this land producing for a long time to come and we have an opportunity here to take a great step in that direction today.

As Aldo Leopold said in his chapter on land ethics in Sand County Almanac:

> "We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong we may begin to use it with love and respect."

Stewardship of our natural resources is conservation at work. Please give the farmers every chance to practice it.

I appreciate the opportunity to appear here today and will answer any questions I can.

Senator **Bond**. OK. Again, I apologize for rushing. We have a couple of other things that are coming up here, and I know that we are going to be having four votes. We want to have an opportunity to hear everybody.

Mr. Bill Bryson, Oak Grove Farm, Alden, Minnesota. Mr. Bryson.

STATEMENT OF WILLIAM H. BRYSON, OAK GROVE FARM, ON BEHALF OF THE NATIONAL AUDUBON SOCIETY, ALDEN, MN

Mr. **Bryson**. Thank you, Mr. Chairman.

INTRODUCTION

I am Bill Bryson. I submitted my written testimony. I am going to deviate from that a little bit and try to keep it brief.

I have been recently appointed to the Minnesota Pollution Control Agency Policy Board. I served for 2 years on our Minnesota State Planning Agency Ground Water Protection Committee, so I have been working on this type of thing for most of the last 30 years. I was president of our Minnesota Association of Soil and Water Conservation Districts, and as is Mr. Williams here, I am a local soil and water district supervisor.

I did participate in the 1985 Conservation Roundtable that Secretary Block called at Peter Meyers' farm in southern Missouri, when we basically, I feel, set the groundwork for the 1985 farm bill. I would commend Congress for passing what was a very good farm bill.

Senator **Bond**. Peter's operation down in Matthews is quite a deal, isn't it?

Mr. **Bryson**. It was great to be there.

1985 FARM BILL

We at that time recommended and the 1985 farm bill did include the conservation provisions of swampbuster, sodbuster, CRP, and conservation compliance. I think it is only a legitimate concern of the farm bill that we expand it at this time to include low-input sustainable agriculture and emphasis on the water quantity/quality issues that are a very serious concern all over the Nation today. Last year's drought really exemplified the concerns that we all have with water.

A LONG-TIME WETLAND PROTECTIONIST

As a long-time wetland protectionist, it is very encouraging for me to see the trends, evidenced in part by your proposed legislation, toward protection and restoration of wetlands. At long last, the very crucial value of wetlands is being recognized.

ENCOURAGED BY PRESIDENT BUSH'S ENVIRONMENTAL PLATFORM DURING LAST FALL'S CAMPAIGN

I was encouraged when President Bush, in his environmental platform during last fall's campaign, promised a "no net loss" of wetlands program. Last month he promised, at a Ducks Unlimited luncheon, and I quote from our local paper back home, "From this year forward, anyone who tries to drain a swamp is going to be up to his ears in alligators."

STATE SOIL AND WATER CONSERVATION AGENCIES IN THE OVERDRAINED MIDWEST ARE SHOWING ABOUT A 180 DEGREE TURNAROUND

Just as significant, State soil and water conservation agencies in the overdrained Midwest are showing about a 180 degree turnaround. The Illinois association newsletter, "The Harbinger," in their spring issue listed the value of wetlands for flood control, sediment control, as a water supply, for ground water recharge, fish and wildlife production areas, for recreation, timber production, and aesthetics. I have attached a section of their newsletter to my prepared statement.[3]

Our Minnesota Board of Soil and Water Resources issued a booklet entitled, "Wetland Protection Options" this spring. The preamble states:

> As we near the 1990's, the need to protect and restore the state's wetland resources is coming into focus. Wetlands are becoming increasingly recognized as part of the solution to our water quantity and quality problems. * * *"

Despite this, we are still losing, despite the swampbuster provision, about 500,000 acres per year which we cannot really continue to sustain. We must redefine our criteria for wetlands under the farm bill. There seem to be some problems, I might say, with implementation through the Soil Conservation Service technical people out in the field, and these problems——

Senator **Bond**. There are real problems.

Mr. **Bryson** [continuing]. Should be resolved. It disturbed me when a local determination last week added a third dimension to the hydric soils/hydrophytic vegetation criteria, by adding the depth to ground water, but I won't go into that. I mentioned it in my statement.

GROUND WATER

With regard to ground water, it is an important feature, the ground water concerns of proposed legislation S. 970. I was on the Ground Water Committee in Minnesota, and we adamantly insisted that prevention of contamination should be our goal, not detection and later action, because once these critical ground waters are contaminated, it is very expensive and very often absolutely impossible to remedy the situation. Prevention, nondegradation, must be our goal.

The red light is on.

Senator **Bond**. Mr. Bryson, if you could, let me say that the record will remain open so that all interested parties can be heard from. Those of you who have listened to these very interesting discussions may wish to add further comments. We find those very helpful, and we will of course take your entire statement for the record.

THE CHALLENGE OF THE NEW FARM BILL

Mr. **Bryson**. I would like to end by saying that the challenge of the new farm bill, as I see it, is a three-pronged one. First of all we must continue to provide adequate food supplies production, not overproduction but adequate food supplies. We must have a healthy economy on the farms of America, and we absolutely must protect all facets of the resource base that supports us all, our great American land.

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[3] See pp. 183 to 185 for the article, "What is a Wetland?", The Harbinger, Spring 1989.

Thank you, Senator.

[The prepared statement and attachment "What is a Wetland?" of Mr. Bryson follow:]

National Audubon Society

NATIONAL CAPITAL OFFICE 801 PENNSYLVANIA AVENUE, S.E. WASHINGTON, D.C. 20003 (202) 547-9009

Statement of

William H. Bryson
Oak Grove Farm
Rural Route 2 Box 181
Alden, Minnesota 56009

Phone 507 874 3413

At the Hearing

on

Conservation and Agricultural Practices

June 22, 1989

Before the

Senate Committee on Agriculture, Nutrition and Forestry
Subcommittee on Conservation and Forestry

Recycled Paper

Good afternoon. I am William H. Bryson. I am pleased to be here today to present testimony on conservation on behalf of the National Audubon Society, an organization I have been a member of for 30 years. I have been a soil and water conservation district supervisor since 1968, was appointed by the Governor to the Minnesota Soil and Water Conservation Board in 1981 and 1982, and was President of the Minnesota Association of Soil and Water Conservation Districts in 1983 and 1984. I also served on the national council of the National Association of Conservation Districts (NACD) in 1984 and 1985. I served on the Minnesota State Planning Agency Groundwater Protection committee in 1987-1988 and in January 1989 was appointed to the Minnesota Pollution Control Agency Policy Board.

I own and operate a 370 acre crop and livestock farm near Alden, Minnesota. I had a 35-cow Grade A dairy operation from 1945 to 1978 and have had a 30-cow cow-calf beef operation from 1970 to the present. Since 1966 I have voluntarily set aside an 18 acre woodlot and an 18 acre wetland complex for wildlife. I do not graze this reserve, nor do I receive any compensation for it. My farm operation has been profitable every year except one since 1945.

My statement starts off with problems that I call your attention to as you begin to put together legislation for the 1990 Farm Bill. I then offer comments on your Farm Conservation and Water Protection Act of 1989, S. 970.

Mr. Chairman, as a long-time wetland protectionist, it is very encouraging for me to see the trends, evidenced in part by your proposed legislation, toward protection and restoration of wetlands. At long last the very crucial value of wetlands is being recognized.

President Bush, in his environmental platform during last fall's campaign promised a "no net loss" of wetlands program. This month he promised at a Ducks Unlimited luncheon that "From this year forward, anyone who tries to drain a swamp is going to be up to his ears in alligators."

Just as significant, state soil and water conservation agencies in the over-drained Midwest are showing a 180 degree about-face. The spring Harbinger, published by the Association of Illinois Soil and Water Conservation Districts, lists the value of wetlands for flood control, sediment control, as a water supply, for groundwater recharge, fish and wildlife production areas, for recreation, timber production, and aesthetics. I have attached the wetland section to this statement.

Minnesota's Board of Soil and Water Resources issued a booklet entitled "Wetland Protection Options" this spring. The preamble states:

> "As we near the 1990's, the need to protect and restore the state's wetland resources is coming into focus. Wetlands are becoming increasingly recognized as part of the solution to our water quantity and water quality problems. A number of nonregulatory programs have been developed specifically to protect and enhance wetlands, while other programs have been developed to reach broader goals which can also protect and enhance wetlands."

Despite the passage of swampbuster and the increased sensitivity for wetlands, we are still seeing a lot of wetland draining in Minnesota, and the whole nation. Last year's drought compounded the situation. Drainers were able to work in drought-dried-up wetlands, often with upland earth moving equipment. A case in point: last winter a realtor and a drainage contractor asked the Freeborn Soil and Water Conservation District district conservationist, a U.S. Soil Conservation Service employee, for a wetland determination on a farm that was for sale in Freeborn County. They wanted to sell it as "improvable" land. The District Conservationist determined that the hydric soil, hydrophytic vegetation criteria were met, and therefore the land was wetland. The new owner appealed this determination, which was reversed by the area soil scientist on the basis that the water table was 36 inches below the surface. The soil scientist attributed the low water table to an old, never maintained shallow ditch in the property and called it a Prior Conversion, despite the fact that it was never drained and NEVER before cropped. Isn't this adding a new dimension to the hydric soil-hydrophytic vegetation formula? Southern Minnesota is still suffering from the most severe drought in over 50 years.

We must refine definite criteria for wetlands and support for that criteria from ALL of our technical field people.

I am happy to see that section 1221 of the Food Security Act of 1985 is proposed to be changed, in Senate File 970 from "in any crop year produces an agricultural commodity on converted wetlands" to "drains, dredges, fills, or otherwise converts wetlands." Under current rules a conversion of wetlands is not a violation until planted to commodity crops. Local officials must monitor such conversions since the obvious reason for the drainage was crop production.

Many farmers in the midwest "corn belt" are designating 66 foot (1 chain) wide field margins as set-aside fields diverted from crop production. Farmers normally must turn around with machinery on these "head lands", and some crop is destroyed. By using this area as "set aside" acres farmers get maximum production to the very edge of the measured crop field. The program does not achieve full hoped for production cuts, and the idled acres, used as turn around headlands, have no value for wildlife and because of herbicide and mechanical disturbances do not even retard erosion. Set-aside requirements should require full fields or parts of fields, not just the un-productive margins.

I am truly happy that you have introduced the concept of wetlands gain in S. 970. As I said, I have converted part of my farm to wetlands, even as my fellow neighbors were draining wetlands to plant row crops. You have recognized that agriculture was responsible for 87 percent of the conversion of wetlands. The best part of your wetlands restoration bill is the goal of 5 million acres and making those wetlands permanent easements.

I want to emphasize how important it is to keep wetlands, once restored, permanent. We can't afford to tolerate conversion from wetlands to cropland and back to wetlands and back to cropland. It makes absolutely no sense to spend tax dollars that way. Therefore, I hope that if Congress permits enrollment of converted wetlands in the CRP as S. 1063 proposes to do, the terms of the contract be made permanent. This would make permanent wetlands restoration under either CRP or the Water Bank.

This brings me to the positive incentives provided in S. 970. The CRP acres now number 30,592,672, larger than the Soil Bank established in 1960. 8.3 percent of CRP acres are in trees, but most of these are in the south where softwood grows very fast. Living, as I do, in the north, we appreciate incentives proposed in S. 970 and S. 1063 to plant hardwoods on CRP acres with 15 year contracts. I am also pleased that both you and Senators Lugar and Boschwitz would provide for easements for shelterbelts, windbreaks, corridors for wildlife and wetlands, permanently vegetated stream borders, filter strips of permanent grass, shrubs or trees, or contoured grass strips established to meet conservation compliance.

Ground water is another important feature of S. 970. As you know Minnesota is greatly concerned about ground water and recently passed strong legislation to protect it. Putting sinkholes in the CRP is a good idea. I see that both you and Senators Lugar and Boschwitz would have the federal government pay for well testing, yours would be representative, and the Lugar bill would pay for voluntary, confidential well testing. Some states like Iowa and South Dakota are requiring well tests to be disclosed at the time a farm is sold. Obviously a farmer does not want to buy a farm that has contaminated well water. Private wells have been left out of most federal and state ground water monitoring, and a need exists to find out whether or not wells are contaminated and to what extent.

Two townships in Freeborn County entered into a domestic water well study last January. A grant from a local foundation and subsidies from the townships reduced the cost to an acceptable $50.00 per well for a broad spectrum water analysis. Sixty two farmers participated in the study. Five of the sixty-two samples had unacceptable levels of four popular farm chemicals including atrazine, alaclor, and propachor. What really disturbed me was the apparent attitude of relief that ONLY five of sixty-two samples were polluted. There should have been serious concern over a trend that is developing, and will probably get worse!

I think, and I believe most farmers want to be able to farm and would be glad not to contaminate their ground water. We rely on our wells for our drinking water, and obviously we don't want to put chemicals in it if we don't have to. I like the concept in S. 970 in which a farmer could be eligible for technical and financial support, including bending program rules, in order to protect his ground water. For example, if a farmer had 500 acres of corn base and he found contamination by atrazine and alachlor, a common occurrence in Minnesota, he could become eligible for help to develop a protection plan. If that plan required that he strip crop on the contour and rotate in alfalfa and oats instead of continuous corn, he could bring his contamination down to nondetectable levels. But this might mean loss of base acres. If he could keep his base acres in order to protect his ground water it would send the appropriate signals to farmers. Right now some of us feel we have no choice but to extract as much production as we can from our land in order to retain base acres.

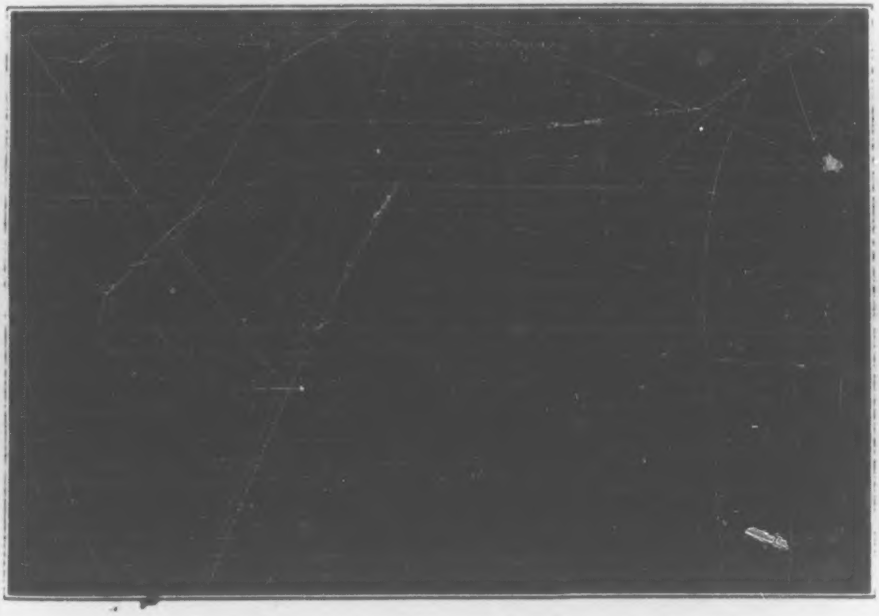
The other important aspect of your ground water title is the start of protection of ground water before it becomes contaminated and in need of remediation. In Goodhue County in Minnesota, alternative water supplies had to be relied upon when water was contaminated. We can't afford to let ground water become the repository for more and more chemicals. Pesticides take a long time to percolate and infiltrate the soil, and once detected residues may persist year round and in some cases levels may increase. I congratulate you for addressing the ground water problem directly and forcefully.

I would like to commend Congress for the Food Security Act of 1985. It provided stability for agriculture in very troubled times. The conservation provisions of Sodbuster, Swampbuster, and Conservation Compliance were big steps forward in implementing good farm policy. I see S. 970 and S. 1063 as an opportunity to refine and improve on an act that was a very good beginning.

SPRING 1989

AISWCD Harbinger

VOLUME 6, ISSUE 1
SPRINGFIELD, IL



What is a Wetland?

SEE PAGES 4 AND 5

Your Wetland - A Valuable Resource

Wetlands have value that many landowners overlook when they decide how to manage their property. As a result, more than half of the wetlands that existed when America was settled have been destroyed. Illinois has lost more than 95% of its wetlands. Many of these wetlands would remain today if their value had been known before they were drained.

What are wetlands? Generally, it's an area of hydric (wet) soil which will support a prevalence of water-loving (hydrophytic) plants. Wetlands are usually wooded or uncropped area with cattails, willows and/or other plants which grow well in wet soils or water. A wetland may also be a wet spot in a field where smartweed, yellow nutsedge and similar plants grow.

In addition to the easy to spot cattail marsh a variety of wet areas fit the 1985 Farm Bill criteria for wetlands. To help keep farmers in compliance, Illinois SCS organized teams to map wetlands. Nineteen Counties statewide have been mapped and the state inventory will be completed by the spring of 1991 according to John Eckes, State Conservationist.

Teams are using an office process to identify wet areas, rather than a field study. They will be looking at hydric soils shown on the Soil Survey for each county, up-to-date black and white aerial photographs, the National Wetland Inventory and ASCS color slides. Using these materials, team members will outline the wetland and identify the type of wetland.

Ray Herman, SCS State Resource Conservationist explained, "We are looking for non-cropland areas that are saturated with water for a week or more during the growing season. We are also interested in potholes and ponded area in cropland that are saturated to the point that crops in those areas usually are not successful. These farmed wetlands still have wetland values and are protected under the Farm Bill." He added, "Farmed wetlands can still be cropped and maintained as they have been in the past."

After an entire county is mapped, the inventory will be used by the District Conservationist to inform landowners and producers about wetland resources on each farm. Similar to HEL determination notices, farmers will receive a map of their land with the identified wetlands marked. Wetland benefits and alternatives will be provided to help farmers stay in compliance. If a mistake has been made using the office procedure, the DC will revise the inventory, making the correct determination.

This inventory effort will help everyone become more aware of the extent of the wetland resources in Illinois. It will also help inform landusers of the valuable part that all wetlands play in supporting a diverse group of plants and animals that protect and improve the quality and quantity of our water and enrich our lives.

Multi-Agency Wetlands Definition Agreement Signed

In a major step toward improving conservation of the Nation's wetlands, four Federal agencies have agreed upon exactly how wetlands will be identified and defined.

"This is a significant step forward in supporting President Bush's promise to prevent any net loss of wetlands," said Frank Dunkle, director of the U.S. Fish and Wildlife Service. "For the first time, the Federal agencies responsible for wetlands will really be talking the same language. This will help ensure that important wetlands are protected and should simplify things for state and local government on the regulations affecting wetlands."

The agreement, titled "A Federal Manual for Identifying and Delineating Jurisdictional Wetlands," reconciles longstanding differences in the guidelines wetland areas, and provides a single, consistent approach for all Federal agencies to use.

The lack of a consistent Federal approach to identifying wetlands and determining their boundaries has long been of concern both to developers seeking regulatory decisions and to conservationists interested in protecting wetlands. The confusion over what constitutes as wetland has arisen because there are many different kinds of wetlands and because the various agencies have differing authorities and responsibilities.

The importance of a clear agreement on how wetlands are defined was highlighted in a Fall 1988 report of the National Wetlands Policy Forum. Adoption of the manual meets the intent of the Forum's recommendation that a single method of defining wetlands be adopted.

According to surveys by the Fish and Wildlife Service's National Wetlands Inventory, nearly half a million acres of wetlands are lost each year in the United States. Of the 215 million acres of wetlands that existed in the United States when the Pilgrims landed, only 99 million acres—about 46 percent—remained by the 1970's.

The agreement was signed in January by Dinkle; Wilson Scaling, Chief, SCS; Rebecca W. Hanmer, Acting Assistant Administrator for Water of the Environmental Protection Agency; and John Doyle, Army Deputy Assistant Secretary for Civil Works.

Wetland Definition

Natural Wetland - An area of predominantly hydric soil which can support a prevalence of water-loving plants. Cattails, willow trees, sedges, rushes, some smartweeds, or other water-loving plants are often present.

Converted Wetland (CW) - A wetland (area of hydric soil) drained or altered after 12/23/85 to enable production of an agricultural commodity.

Farmed Wetland (FW) - A wetland that was partially drained or altered to produce crops prior to 12/23/85. The land was not completely drained, and may have potholes or seasonally flooded areas that still meet wetland criteria.

Prior Conversion (PC) - Wetlands that were converted to cropland use before 12/23/85. This cropland use was completely drained or otherwise altered to make it possible to produce crops, and it no longer meets wetland criteria of saturated soil or water-loving plants.

Abandoned Wetland - Wetlands that were once altered and farmed, but have been abandoned as cropland. No attempt was made to maintain the area as cropland for at least five successive years, and it now supports water-loving plants.

How Wetlands are Valuable to You

FLOOD CONTROL. Many wetlands store flood waters and then release them slowly. This reduces the height of downstream floods and lessens the risk of flash floods.

SEDIMENT CONTROL. Wetlands act as settling ponds, allowing fertilizers, pesticides, and other pollutants to be absorbed and broken down chemically.

WATER SUPPLY. Some wetlands are used as source of domestic water. Others provide water for irrigation and livestock.

GROUND WATER RECHARGE. Wetlands are important recharge areas for underground fresh water aquifers.

FISH PRODUCTION. Many of the 4 1/2 million acres of open water in inland wetlands provide an ideal habitat for sport fish.

WATERFOWL AND OTHER WILDLIFE PRODUCTION. Wetlands provide water, food, nesting, and resting areas for a wide array of game and nongame wildlife species, including some federally listed endangered species.

RECREATION. Wetlands provide areas for recreational activities such as hiking, canoeing, fishing, hunting, photography, and environmental education.

TIMBER PRODUCTION. Wetlands containing hardwood trees can produce income trough timbering. The hardwood market is increasing in value faster than the softwood market in many areas of the country.

AESTHETICS. Most wetlands contain a wide variety of plants and animals, providing great beauty and a place for recreational and visual enjoyment.

Wetland Questions

What is a Wetland?

Generally, a wetland is an area of hydric (wet) soil which will support a prevalence of water-loving (hydrophytic) plants. Wetlands are usually wooded or uncropped areas with cattails, willow and/or other plants which grow well in wet soils or water. Wetland may also be a wet spot in a field where smartweed, yellow nutsedge and similar plants grow.

What is a Farmed Wetland?

Farmed wetlands are potholes or seasonally ponded and flooded areas in a crop field that have not been completely drained, and still meet the wetland criteria. These places may be saturated to the point that crops usually are not successful. Farmed wetlands may be used to grow agricultural commodities and maintained in the same manner as they were prior to December 23, 1985, as long as they are not abandoned.

What is Abandoned?

A prior converted or farmed wetland is considered abandoned if no effort has been made to maintain it as cropland for at least five successive years and its wetland characteristics have returned.

May I Fix a Broken Tile in my Farmed Wetland?

If you have not abandoned the wetland area, you may maintain present drainage installed prior to December 23, 1985, that made the production of an agricultural commodity possible.

Can I Plant Agricultural Commodities in my Wetland When it is Dry Enough?

Yes. You can plant in areas which are natural prairie areas (without trees) or areas where the wetland had a commodity crop produced prior to December 23, 1985, and has not been abandoned.

Can I Plant my Converted Wetland to Corn or Soybeans if I Don't Harvest Them?

No. In any year an agricultural commodity crop is planted in a converted wetland you will be ineligible for USDA benefits.

Can I Clear Trees From my Wetland and Plant Commodity Crops?

No. After December 23, 1985, the removal of woody vegetation, including stumps, makes the area a converted wetland. Planting commodity crops in the converted wetland will jeopardize your eligibility.

Can I Harvest Timber on Wetlands?

Normal forest management practices, including harvest, are permissible as long as you do not convert the wetland and produce commodity crops after timber harvest.

How Do I Know if I Have a Wetland on My Farm?

If you plan to drain, fill, clear woody vegetation or otherwise alter a wet area check "yes" on form 1026 and USDA will make a determination and let you know the results.

When Should I Request a Wetland Determination?

A wetland determination should be requested well in advance of the time you plan to alter or install new drainage by checking "yes" to questions 7 and 8 on AD-1026.

What if I Disagree with USDA's Wetland Determination?

Call or visit the SCS office and ask for a reconsideration. Explain your reasons for disagreeing to the District Conservationist, preferably during an on-site visit.

What is "Swampbuster"?

Swampbuster is a term used to identify a person who converts a wetland, after December 23, 1985, in order to produce an agricultural commodity.

If I "Swampbust" in Illinois, Does it Effect my Cropland in Other States?

Yes. Planting commodity crops on converted wetlands makes you ineligible for USDA benefits on all you cropland in all states.

Senator **Bond**. Thank you very much, Mr. Bryson.

For our final witness on this panel we have Mr. Bob Gray of Resource Management Consultants, Inc., in Washington, D.C. Welcome, Mr. Gray.

STATEMENT OF ROBERT J. GRAY, PRESIDENT, RESOURCE MANAGEMENT CONSULTANTS, INC., WASHINGTON, DC

Mr. **Gray**. Thank you very much, Senator Bond.

INTRODUCTION

Senator Bond, I will keep my comments very brief, recognizing that the time of the subcommittee is limited. I think that it is appropriate that one person on all these panels be from inside the beltway, although I would say that my work covers a lot of involvement with conservation organizations all over the country. I worked on the 1985 farm bill.

I COUCH MY REMARKS IN THE TERMS OF THE WHOLE QUESTION ABOUT SUSTAINABLE AG OR LISA

I would like to just couch my remarks in the terms of the whole question about sustainable ag or LISA.

The important issue here is this kind of agriculture. Sustainable agriculture is not something that is necessarily "back to the future" and we are not going back to the mule and the hoe. The idea here is that sustainable agriculture is really mainstream agriculture. There is a range of options that farmers have to reduce ag chemical inputs today.

I think if you recall when we were dealing with the definition of conservation tillage in the late 1970's, there were probably 30 different definitions of conservation tillage. The same problem exists for sustainable ag. These are going to sort themselves out.

We know that this is a range of reduction, in terms of those farmers that can move perhaps all the way to using very little chemicals, pesticides and fertilizers, to those farmers that may reduce by 30 or 40 percent, and find that that is within the profitability range.

I would have to take exception, as Senator Fowler did, to Dean Kleckner's remarks. This is not a fad. Farmers are interested in this. There is an explosion of interest in sustainable ag all over the country.

To give you an example, I work with a small national toll-free line for farmers to call for information on sustainable ag. They have had more than 6,000 calls from farmers all over, in every State. The ATTRA (Appropriate Technology Transfer for Rural Areas) program, now operating out of Fayetteville, Arkansas, gives farmers information on how to use chemicals, on how to reduce them and other issues relating to sustainable agriculture.

In addition, we have done a series of surveys of farmers for different private, nonprofit organizations, that show that farmers are extremely aware of ground water contamination by chemicals and they are concerned about it. It affects their own personal well-being—their family, their rural community, and themselves. Many of them are trying things, as a number of witnesses here pointed out before, they have tried a number of things to reduce chemicals on their own farms. We need to probe them more to find out what they are doing, what works well.

THERE ARE TWO THINGS THAT THE FOWLER BILL AND OTHER LEGISLATION CAN ADDRESS

I think that there are two things that the Fowler bill and other legislation can address, and some of them have already started to address this.

First of all, we need to level the playing field as far as the commodity programs are concerned, to offer some incentives, to offer some opportunities for farmers to move to a sustainable system.

Secondly, we need USDA to develop, just as we have for conservation plans, a sustainable farm plan that a farmer can move to in a transition maybe over 3 or 5 years, and set some targets where they can reduce some of their inputs, keep their profitability level, maybe even increase it, and certainly keep very close track of their yield level.

FARMERS ARE NOT GETTING INFORMATION ON THIS FROM ANY OF THE FEDERAL AGENCIES

One of the things we find in the field survey is that farmers are not getting information on this from any of the Federal agencies. That is really a problem. You pointed out the need for education. Senator Fowler pointed out a survey recently that I was involved in, that found that most farmers got their information on ground water and on sustainable ag issues from other farmers or from the fertilizer dealers and the chemical dealers. Extension and USDA agencies ranked very low.

CONCLUSION

So what we are finding is that we need to really move the information, the research, out to the farmers. We need to make some basic changes in the commodity programs that will allow farmers to try sustainable systems, to get USDA moving on this. I can tell you, what was accomplished in the 1985 farm bill with soil conservation sent a very clear signal through the whole United States that conservation is important. We need to do that with sustainable ag.

I appreciate the opportunity to testify, and thank you.

[The prepared statement of Mr. Gray follows:]

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TESTIMONY OF

ROBERT J. GRAY
PRESIDENT

RESOURCE MANAGEMENT CONSULTANTS, INC.

BEFORE THE

CONSERVATION AND FORESTRY SUBCOMMITTEE

OF THE

UNITED STATES SENATE
AGRICULTURE, NUTRITION AND FORESTRY COMMITTEE

JUNE 22, 1989

STATEMENT OF MR. ROBERT GRAY, PRESIDENT, RESOURCE MANAGEMENT CONSULTANTS INC.

Mr. Chairman, members of the Subcommittee, my name is Bob Gray. I am president of Resource Management Consultants Inc., a Washington, D.C. based consulting firm specializing in natural resource and land conservation issues. I appreciate this opportunity to speak to you on environmentally safe agricultural technologies and impediments to their adoption.

First, I would like to commend you for holding these hearings and for your leadership in developing S.970 The Farm Conservation and Water Protection Act of 1989. This legislation provides us with an opportunity to discuss a number of key issues central to the 1990 Farm Bill.

I have been involved with farming since growing up on a dairy farm in upstate New York. For many years I have been involved in federal agricultural policy development, representing numerous clients interested in preserving farming and farmland while protecting the environment. My clients have included: American Farmland Trust, Agricultural Law and Policy Institute, National Center for Appropriate Technology, National Association of State Foresters and the Society for Range Management. I am also a member of the Conservation Coalition with over 40 member organizations. Through my involvement with the 1985 Farm Bill I am keenly aware of the many conservation related agricultural issues facing farmers today.

The most profitable and technologically sound innovations for farming in the future exist on the farm itself. It is technology that draws on the internal resources of the farm, to maximize what the farm has to offer, while minimizing the amount of external resources needed to support the farm operation. Sustainable agriculture is the technology of the future because it makes economic, environmental and common sense.

Sustainable agriculture rivals the Bible in the number of interpretations it has inspired. For my purposes, a sustainable farmer falls within a broad range which includes a farmer who is just beginning to reduce chemical use all the way to someone who has completely eliminated purchased off farm inputs (such as pesticides and fertilizers) from his farming system. For example, many farmers could immediately begin reducing chemical use by 30 to 40 percent by changing some of their farming practices. Eventually, some farmers may be able to reduce most chemical inputs. In general, sustainable agriculture includes some old and many new farming practices which reduce the use of agricultural chemicals, incorporate soil conserving measures and protect groundwater. A sustainable system may not necessarily be a radical departure from many of the farming techniques that farmers are already using out of concern for profitability and health.

My work indicates that there is a ground swell of interest in sustainable agriculture. I work directly with ATTRA (Appropriate Technology Transfer for Rural Areas), a service of USDA-Extension, whose job is to provide information to farmers and farm professionals about sustainable agriculture. ATTRA is available to everyone through their toll-free telephone number. Since its inception in 1987, ATTRA has received over 6,000 phone calls on topics such as agronomy and horticulture, animal enterprises, production techniques, pest management, policy and economics. ATTRA has experienced an explosion of interest this year, receiving phone calls at a rate of over 100 per week.

Despite evidence of significant interest, the concept of sustainable agriculture is still often misunderstood and doubted among many traditional farmers. Why isn't there universal acceptance of sustainable agriculture as a legitimate farm management system? Numerous reasons have been suggested, however, two stand out as the principle culprits. The first is the structure of commodity programs, which discourage innovation and rotation. The second is the lack of information getting through to farmers about sustainable agriculture. I'd like to elaborate briefly on each of these points.

It is an indisputable fact that the link between farm program payments and historical base acreage works against the adoption of rotation systems and new product development. Before most farmers will even consider a new farming system, current farm commodity programs must be changed. In this regard, I fully support the provisions in the Farm Conservation and Water Protection Act that permit farmers to plant up to 40 percent of any crop base to resource conserving crops. I also support the concept of providing some form of financial support to farmers during the transition period from traditional to sustainable agriculture. By altering the disincentives that exist in current farm commodity programs, farmers that choose to practice good stewardship for the land will be supported rather than penalized.

Changing farm programs will also send a clear message that it is the policy of the United States Department of Agriculture to support sustainable agricultural practices which result in environmentally sound land management.

The other principle reason that sustainable agriculture is not a household word is due to the lack of usable information reaching the farmer. This problem has been mentioned repeatedly by individuals out in the field, such as Rich Gauger, coordinator of the Sustainable Agriculture Program at the Minnesota Department of Agriculture. Solving this problem will require creative approaches to information transfer.

The survey of farmer attitudes towards groundwater contamination that we just released for the Agricultural Law and Policy Institute suggests that the primary sources of information on groundwater for most farmers are other farmers and family members. Farm chemical dealers, extension agents, and Soil Conservation Service ranked behind the local community sources in order of their importance in providing information. The local community is one of the best and most trusted sources of information for a farmer, therefore information specialists must start the information transfer process by getting a few farmers visibly involved with a sustainable system. This personalized approach can be accomplished a number of ways.

First, and probably most important, a farmer must be assisted in the development of a Sustainable Agricultural System Plan for his farm. The plan must be clear and comprehensive, in other words "farmer friendly", outlining in a step by step fashion how a farmer should move to sustainable agriculture. The complete farm operation must be considered for this to be effective. According to Rich Gauger, farmers are often provided information "components", or advice about discrete aspects of their operation. This form of information is not useful because it fails to relate to the whole farm operation. Additionally, for the plan to be accepted by the farmer, the professional involved with the development of the plan must be well trained, and knowledgeable about sustainable agriculture and the geographic area in which they are employed.

Second, demonstration plots, in cooperation with the farmer and his information sources, should be initiated throughout a geographic region. Many farmers must see that a technique works before they will consider attempting it on their own farm.

Third, the Land Grant Colleges, to whom many states and farmers look for support, must be encouraged to perform more research in the sustainable agriculture field. In this regard, they must be pro-active in ferreting out important new technology and demonstrating its usefulness to people out in the field.

Dwight Ault, a farmer summarized what farmers need in an article in the Journal of Freshwater. He said:

> "Farmers, if they have misgivings, need to find someone else who has those same misgivings, or five to ten others who have the same ideas and share these common concerns. If you're going to have problems, you don't like to be the only one. Sharing concerns and misgivings and ideas is a good first step.
> ...We have to commit to being "different"- and that's asking a lot of farmers. They need more information, and they need more support if such a change is going to take place on a broad scale."

Finally, I would like to discuss the links between groundwater contamination and sustainable agriculture. As I mentioned earlier, the Agricultural Law and Policy Institute has just released the results of a survey where 568 farmers in five counties were interviewed to assess farmer opinions on possible legislative initiatives with which farmers would be expected to cooperate.

The link between farm chemicals and groundwater contamination has been clearly established. Sustainable agricultural systems are seen by many as a means of reducing groundwater contamination. For example, this link was affirmed by many state legislatures this year. There has been a notable increase in financial support for sustainable agriculture programs. The legislative action is seen as a means to address public concern about pesticides and groundwater contamination.

Our survey found that the farmers interviewed are aware of the hazards and potential costs of groundwater contamination and are amenable to state and federal programs designed to prevent or alleviate this problem.

Farmers were receptive to suggested federal research and technical assistance programs to help them reduce their use of agricultural chemicals; and to proposed state programs to regulate the use and distribution of agricultural chemicals in areas at high risk of groundwater contamination. A small percentage of the farmers interviewed receive information about groundwater quality from federal agencies such as the Extension Service and Soil Conservation Service. However, farmers generally expressed a willingness to learn about ways of reducing their agricultural chemical use. This highlights the need to improve the federal resources for developing and disseminating information about agricultural practices consistent with the protection of groundwater quality.

In conclusion, it should be recognized that sustainable agriculture is a part of mainstream agriculture. Our surveys indicate that farmers are beginning to move away from chemicals voluntarily, but need more information and assistance to help them do so. The federal government should support farmers in this effort by revamping commodity programs to encourage rotation and innovation. In addition, creativity should be employed to transfer sustainable agricultural technologies to the farmer. For example, Sustainable Agricultural System Plans for individual farms should be developed, community demonstration plots encouraged and land grant colleges should be actively involved in developing new technologies. Incentives for good stewardship should be a part of the next farm bill.

Sustainable Agricultural Systems merge the best of current and past farm practices with progressive new technologies. Congressional efforts to encourage sustainable agricultural practices will produce positive results in the future for the health of farmers and their families, the environment and the farm economy.

Thank you very much for the opportunity to testify. I will be pleased to answer any questions.

Senator **Bond**. Thank you, Mr. Gray. I note that the time for the statements has expired. Senator Fowler has asked if this panel would be available to come back at 2 o'clock for further questions. If you have other commitments and can't make it, we would understand, but Senator Fowler I think has indicated that he would like to ask you some questions. If it is not too great an inconvenience, I would suggest that you come back. We will take questions from this panel, and then shortly thereafter move on to panel number 4.

Gentlemen, I apologize that I am going to have to leave. Since Senator Fowler is not back, we will adjourn the hearing until 2 p.m. this afternoon. Thank you.

[Whereupon, at 11:50 a.m., the subcommittee adjourned, to reconvene at 2 p.m., the same day.]

AFTERNOON SESSION

Senator **Fowler**. We have Mr. Gray, I recognize, Mr. Bryson. Mr. Williams, was he able to stay? You can rejoin us here. Dr. Early, come in.

Mr. **Early**. Am I on the next panel? I'll wait.

Senator **Fowler**. We will give you first-hand treatment in just a minute, Dr. Early.

Bob, since I missed, I have your written testimony but let me just quickly—what can the Department better do in the areas of research and education?

Mr. **Gray**. First of all, Senator Fowler, I would just like to say, since I know you were busy over on the Senate floor, I want to commend you for holding this hearing and for your leadership in introducing S. 970. This is really the first time we have had a piece of legislation far enough in advance of the farm bill to flush out the issues, and that is going to be very helpful to all of the agricultural conservation community.

In terms of research and education, as you mentioned this morning, the education area, as far as the Department is concerned, is very weak. When we talk with farmers, as far as information either on ground water or sustainable ag, most of the farmers are very receptive to ideas but they list the Federal agencies very low as sources of information.

We need a very straightforward, concerted effort to get information, educational information, out to the farmers, and we certainly need more funds earmarked for research than $4.5 million. That is a paltry amount, as you know.

Senator **Fowler**. In my experience in working with farmers, they are asking for it, aren't they?

Mr. **Gray**. They are asking for it. Yes, sir, they are. They are a little skeptical about the question of yields and profitability, but that doesn't mean they are not interested. They are very interested. They want more research funds. They want to see it directed in this area. They want more technology transfer. They want to see this information get down to them as rapidly as possible. They are very receptive to this, very receptive.

Senator **Fowler**. Well, I appreciate that.

One other quick question: Our programs, the Government's farm programs, do you conclude that they are biased against new agricultural practices?

Mr. **Gray**. Well, they certainly don't lend themselves, as they are currently structured, to farmers going to sustainable systems, because it has been based on a highest yield base system that doesn't allow a farmer really to work toward reducing their inputs.

What we would like to see is sort of a level playing field, in a sense that some of the incentives that you have built into your bill and perhaps other incentives that come along within the commodity programs that will give a farmer an opportunity to move to a sustainable program over a period of time and not be penalized for it, as he might be now, the way the current commodity programs are set up.

Senator **Fowler**. Mr. Bryson, do you feel that we could reduce, somewhat, chemical and fertilizer use and still have yields enough to maintain a decent profit?

Mr. **Bryson**. We have had sustainable agriculture seminars back in Minnesota, and the reports that we have had there seemed to indicate that we can come very, very close. It takes more management, perhaps is more labor-intensive, but we have become overly dependent upon chemicals as an industry, I think because it has been an easy way to go.

Senator **Fowler**. Well, what is it, in your opinion, that is holding farmers back from trying alternative agricultural practices, whether it be IPM, low-input, or whatever?

Mr. **Bryson**. Last week I was visiting across the fence with a neighbor, which farmers still do, and the neighbor was spraying. He said, "I wish that we could get away from spraying, but I am afraid that if I quit, I will be at an economic disadvantage to my neighbor."

Now that is the fear that they have. I think it is a fear that has been—we talk about the education system—I think it may be a fear that has been educated into them by our Extension Service over the last 20 years, because Extension has been advocating high chemical use as the way to go, as the modern trend in agriculture.

Senator **Fowler**. Mr. Williams, in my absence in your testimony you brought up the issue of conservation compliance and alternative conservation systems. What is the perception in the field about this? How is it working in your Conservation District? What, if anything, should the subcommittee and the committee do about it?

Mr. **Williams**. Senator Fowler, I'm sorry you weren't here when I made my brief remark. Could I just reread the paragraph? I think that says it best.

Senator **Fowler**. You certainly may.

Mr. **Williams**. I also have grave concerns about the implementation of the 1985 farm bill. In May of 1988, SCS Chief Wilson Scaling ruled that Alternative Conservation Systems will be available to every producer on highly erodible land soils irrespective of economic consideration or producers' ability to comply with tougher rules. This ruling seriously erodes the credibility of the conservation compliance section of the 1985 farm bill, and should be changed by congressional mandate.

We need people in USDA who care about conservation and would fully implement the will of Congress. Some of the current appointments, like Mr. Cason, lack these credentials. I am speaking from the viewpoint of myself, being a soil commissioner.

Then in answer to your question, we review, as commissioners we review the farm plans, and some counties have been strict enough to say they won't allow any alternative conservation compliance. Our county hasn't been that strict, but we are seeing some highly erodible soils that are being extended out on alternative conservation compliance. Their set-aside doesn't have to be enacted until 1995, so we are seeing them going clear out to 1994 before they are even starting to do the conservation compliance part of it, so this is troublesome to me.

Another comment along that line I would like to make—I didn't get a chance to this morning, we were hurried—is that a lot of the opponents of funding your bill are saying that we shouldn't be paying a farmer to do certain practices. My answer to that is, it seems to me like we have some targeted areas in America that are highly erodible, and this would be the place to come in with crop rotation and I could see some economic benefits that could flow back to that farmer that would be very advantageous to keeping that soil from being lost.

I talked this morning about the corn/soybean rotation that goes on in my four-State area there, which is one of the four most highly erodible areas in America, so I think it is important. I just came from a meeting with Secretary Yeutter. I have known him for 40 years, and had a chance to be with him for about a half hour, and I pointed this out to him, so he is aware of it, just the targeting.

Senator Fowler. Good. I appreciate it.

Are there any other comments?

Mr. Williams. I would like to make a couple of other comments. I was hurried this morning.

Senator Fowler. Please.

Mr. Williams. Being a district soil commissioner—and this isn't new, what I am going to say now—but I checked with our SCS to find out what the budgeting was for the Soil Conservation Service. The total budget for SCS in 1989 is $716 million. A little over half of that goes to administration, which leaves approximately only about $300-plus million that goes to actual practices. I just said in my statement that I think we need to fund this higher.

I would like to point out something I picked out of the Wall Street Journal: "Army gives United Technologies $1.2 billion." It goes to the United Technologies Sikorsky Aircraft U-1160 electronic equipment, so we are funding one military weapons electronic program twice what we are funding the SCS program nationally, and I just think that we could put our priorities a little more in balance there.

The other comment I had was, real quickly, I also got from the SCS, we have had one of the highest erodible things that are happening from a cultural standpoint is farmers putting end rows up and down the hill, so I asked SCS to give me those figures. I won't read you how they got the formula, but you get, with end rows up and down a hill on a 5 to 7 percent slope, you get from 11 to 17 tons, which is almost two to three times what you should get on a contour, so this is something we could immediately encourage. Now you can use a set-aside for it, for those end rows, buffer strips, but farmers, very few——

Senator FOWLER. Are doing it?

Mr. WILLIAMS [continuing]. Are doing it.

Senator FOWLER. Thank you, Mr. Williams.

Mr. Bryson, do you want to make a concluding comment?

Mr. BRYSON. Well, first of all, when I testified this morning I neglected to mention that I am a member and testifying on behalf of the National Audubon Society. I have been a member of the Audubon for over 30 years. I, too, am a soil and water conservation district supervisor.

Our resource conservation inventory in Minnesota was in good shape. When we got the 1985 farm bill, it became a high priority item to designate our highly erodible lands. We in Minnesota are right on target and are not having any great opposition to the conservation compliance measures of the 1985 farm bill. We welcome them and we are glad to have an opportunity to be doing our share on that part.

Thank you, sir.

Senator FOWLER. Thank you very much.

Mr. GRAY. Senator Fowler, I have just one quick comment.

I think it is important for the farmers to understand, as we make some changes, suggest changes in the commodity programs, that even those farmers who will stay in a full corn/soybean rotation can find ways in the sustainable system to reduce their inputs. We are not talking about farmers losing their base. We are not talking about them moving into other crops. That isn't the idea, and no one, I think, that is interested in the sustainable ag program is talking that way.

There is a whole range of things. I think you mentioned that this morning. It is certainly not a fad. I mentioned, when you had to leave to go to the Senate floor, Dean Kleckner's remark, we see all the way across the board interest in this in the farm community. It is coming in this direction, but there is a whole range of things that we can do with farmers in all kinds of rotations and systems on sustainable ag that can help reduce inputs and therefore farm in an environmentally safe manner, and I wanted to make that plain.

Thank you.

Senator FOWLER. Thank you.

Gentlemen, thank you very, very much for your twofold participation.

Our last panel is Mr. Beck, Dr. Early, and Mr. Jake Redmon. Gentlemen, my special appreciation to you. We like to think we can do everything within 3 hours, but I hate to cut people off, and especially when we had the administration here. As you saw, we have, just like this latecomer here, we have one Senator coming in at a time and then they get to ask their questions, so we get behind. I know I have inconvenienced you by asking you to be here this afternoon, but I am going to give you plenty of time.

Joining us is my colleague, Bob Kerrey, a Senator from Nebraska. Welcome, Bob.

Mr. Beck, would you like to begin? Mr. Bob Beck, the manager of training and laboratory technology at Cenex/Land O'Lakes, St. Paul, Minnesota, home of the former, 2 years ago world champions.

STATEMENT OF ROBERT H. BECK, MANAGER, TRAINING AND LABORATORY TECHNOLOGY, CENEX/LAND O'LAKES AGRONOMY SERVICES, ST. PAUL, MN

Mr. Beck. Mr. Chairman, thank you very much. It is indeed a pleasure to be here.

INTRODUCTION

I am the manager of crop production and agronomic training for Cenex/Land O'Lakes, which are two regional cooperatives that basically cover from Lake Michigan to the Pacific Ocean and from Nebraska/Colorado north to the Canadian border, so we cover 15 States in our trade territory. As a cooperative, a regional cooperative, we are owned by the members we serve, the patron members of that region. That gives us about 1,500 dealers throughout the Pacific Northwest area that we deal with.

My staff and I are responsible for the agronomy tech component of our organization, and you have a copy of the written testimony. I guess I would like to highlight some key things.

Senator Fowler. Please.

OUR RESPONSIBILITY

Mr. Beck. Basically, what our responsibility is in Agronomy Tech Services, is to carry out the mission statement that Cenex/Land O'Lakes has for the Agronomy Company, which is a joint venture between the two cooperative entities. It is to profitably market agronomic products and services within North America that enable the farmers and ranchers to achieve maximum production efficiency and profitability.

STAFF

With that as a mission statement, I have a staff that includes myself, three Ph.D.'s—my Ph.D. is in soil science, I have a soil chemist, and I have a soil microbiologist. I have four with an advanced Master of Science degree, plus several B.S. students and people that are involved out in the field as well. So with that staff, we basically are involved in this cooperative program.

THERE ARE THREE THINGS THAT WE DEAL WITH

There are three things that we deal with. Number one, as a cooperative we distribute products only. We are not a primary manufacturer of either crop protection products or plant food, so we distribute all and any that meet our criteria.

Second, where my staff is located in the buildings, we are physically located between our plant food division and on the other side then is our plant production division, marketing.

The third point, then, is being physically located as such, we also serve then, as I feel, as the conscience of the Agronomy Company. We are responsible for product selection at each of the division markets, and so our method of serving as this conscience of the company deals with three key areas: One is information gathering; second is information delivery; and third is human expertise.

ASSIST FARMERS IN THE BEST CROP PRODUCTION DECISIONS POSSIBLE

How do we customize it when it hits the field in Montana, versus Washington, versus Nebraska, versus Iowa, et cetera?

For example, we do have two separate divisions. The Crop Protection Division, I will start with that one first. For example, in the information gathering segment we do what is called efficacy research. It is not the basic research. The products that come to us already have been granted experimental use permits or are about to be released with a label to the market, so they have passed all the EPA requirements, the OSHA requirements. Their labels are approved and their material safety data sheets are approved with them.

We ofttimes get them before they are released to the market, so we have an idea. Does it work? The three permanent locations that we deal with are Answer Farm at Fort Dodge, Iowa, and we also have research that we are cooperating with the University of Wisconsin at River Falls, and then at our facility at Moses Lake, Washington. So when we bring them into those specific locations, we are doing some of the same kinds of applied research that the University Extension Service is doing when they bring them into the field and say, "Does it work in these counties? Do we have some problems with it actually performing as identified?"

All the chemical companies would like to have you believe that their product is going to work at 90 to 95 percent control of the pest, whether it be a herbicide for weeds, an insecticide, a fungicide, what have you. Our job is that it rates good, fair, poor in this cropping environment system, so we try to do this in systems.

Senator **FOWLER**. Then what do you do with that information?

INFORMATION DELIVERY

Mr. **BECK**. That information goes into—perfect timing—right into information delivery, because to do something with that we have to deliver it to our dealers so that they can relate, then, to the growers, and we do that by several methods. One is, we produce a crop production guide. In that we have charts basically saying that for control of this product, it will either give suppression control of fair, good, excellent, or poor, and we do have arguments routinely with chemical companies who say, "It is unfair. You didn't treat us fairly with your rating."

So we deliver that information by way of the manuals, factsheets, our label manuals, as well as our computer information delivery system that was reported on by a couple of my colleagues, Al Geise and Dr. John Ulrichs, earlier to the Senate Committee on Agriculture, but that AgriSource program gets the information there.

The third part is that once we have the information in each of those locations, delivering it to the location so it can be customized for a given cropping system is the third part.

I just came in yesterday from training that we are doing at Fort Dodge. We started last week in Moses Lake. We trained 24 of our dealers there, half in irrigation, half in dry land. At Fort Dodge we trained 15 of Dow's people, their new people, and we also have right now—I am missing that training—70 of our B.S.-level agronomists that have just hired on in the last year, and it is extremely difficult, sir, to find 70 B.S.-level agronomists. We don't have very many students out there. They have given up on agriculture as a viable career.

Senator FOWLER. We have 100 B.S.-level politicians here. [Laughter.]

Mr. BECK. I should have made myself clear. Bachelor of Science.

Senator FOWLER. We'll have to lend you a few.

Mr. BECK. But they have to be qualified.

Senator FOWLER. That has never been a requirement in our profession. [Laughter.]

THE KEY THING IS CROPPING SYSTEMS

Mr. BECK. The key thing is cropping systems. We are not simply selling products. What we are trying to do is develop them with a human expertise to cropping system, because the dairy management system in Wisconsin is entirely different from the product selection that one can use in the corn/soybean rotation we have heard about in Iowa, the wheat/fallow rotation that occurs in Montana or the Great Plains, et cetera, as you go along, because it limits what herbicides one can use, what insecticides, because we do have crop rotation requirements.

IN THE PLANT FOOD AREA WE HAVE THE SOIL TESTING LAB

In the plant food area we have the soil testing lab. It is an important concept. I guess if there is a crusade that I have, one is that we are testing less than 10 percent of the soils in the United States for fertility, for organic matter, for use in that product. Basically, what we have done is treated it as a disposable number.

Senator FOWLER. The soil?

Mr. BECK. The soil sample with soil test information, because the reason for gathering it is to develop a plant food requirement to achieve a yield goal. For example, this sample is taken, the bulk blend is made and applied to the field, and then basically that number is discarded. I can get them to come back in 3 years again and take another sample, but it has been treated as a disposable number.

RECORDS

Washington, the State of Washington, has just required that records be kept for a minimum of 7 years. Texas is now 20 years, and of course California is leading our model, as was mentioned earlier in the presentation, but we need to develop that as part of our record program, and we are not testing any more than 10 percent of our acres. That is one thing that we can do right now. We are in place where we can do that.

THE NITRATE-GROUND WATER ISSUE

The nitrate-ground water issue is of major concern. One of the promotions that we ran this year with our lab is, for every four soil tests that a farmer sent in, we gave them a free nitrate-water analysis for their well water. We handled over 1,200 of those. It was well received.

Unfortunately it is a one point in time snapshot. In order to deal with nitrates, one has to do it over time, so we will be repeating that, but 96 percent were below the 10 parts per million Federal standard. Of those that were higher, we sent out a second test, and then on those that tested high, basically we indicated the steps they need to take to address, "How do I correct it?" or, number one, find out exactly what the problem is, because too many problems are just simply closed-loop problems. So we are pleased from the standpoint of the numbers, but we are at that.

BEST MANAGEMENT PRACTICE

I guess the key thing, to wind up, is that best management practices and systems are very site-specific. A best management practice is not transferable directly across the line, but on the other side, if we know about the soils—and, for example, the Central Sands of Wisconsin where we have the Aldicarb issue is one, ground water-nitrates are another—those soils are Typic udipsamments. A Typic udipsamment is a very sandy, highly leachable soil. We also have Typic udipsamments in the Columbia Basin. That information can be transferred back and forth, but we don't do that very well.

We do have a model we would like to encourage, the Benchmark Soils Project. Now that is the international community, but that would be the approach, so our goal is to advise the grower-members on specific best management practices for their individual cropping systems based upon scientific principles. If it is agronomically sound, it will be economically as well as environmentally sound.

Thank you.

[The prepared statement and attachments of Mr. Beck follow:]

TESTIMONY OF

Dr. Robert H. Beck
Cenex/Land O'Lakes Agronomy Services

before the

Senate Committee on Agriculture, Nutrition, and Forestry
Subcommittee on Conservation and Forestry

June 22, 1989

My purpose today is to explain the agricultural methods my company, the Agronomy Company of Cenex/Land O'Lakes, is utilizing to balance the need for environmental safety with that of economic crop production.

Cenex/Land O'Lakes is an agricultural cooperative, owned by farmer members in 15 midwestern and pacific northwestern states. The Agronomy Company of Cenex/Land O'Lakes markets plant food and crop protection products to farmer cooperative retail dealers who, in turn, provide agronomic products and services to farmers to achieve maximum production efficiency and profitability.

Cenex/Land O'Lakes has a long and well-established history of offering agronomic programs and maintaining a strong commitment to research programs to back-up our programs. We are committed to provide training and technical knowledge about our agronomic products to our dealers and their farmers that is agronomically, economically and environmentally sound.

Our job is not getting easier. Concerns about the environment are calling for changes in farm practices and input use. In attempting to make significant changes in present practices, farmers and ranchers must deal with several obstacles, including time limitations, knowledge and information limitations, new technology, and the need to increase efficiency in crop production.

Our approach to help dealers and farmers meet these challenges was to develop a retail agronomy system to provide technical information to dealers who can then work with each producer to develop the best management practices for the fields and crops on his farm. This approach calls for precision farming and information management.

The retail agronomy system is based upon three increments of agronomic professionalism:

- information gathering
- information delivery
- human expertise

As Manager of Crop Production and Agronomic Training, it is my responsibility and that of my staff to constantly stay abreast of new developments in agronomics, help facilitate research, and provide ongoing training and expertise to agronomists, dealers and farmers in our marketing area. To keep up with the information, I have on my staff 3 Ph. D. Soil Scientists, plus 4 individuals with Masters degrees in Entomology, Weed Science, Agronomy and Plant Pathology. In addition, we have a full time staff conducting research at our major research farm near Ft. Dodge, Iowa, and at our research station in the Pacific Northwest, and at individual farm sites across our market area. This staff will handle over 50,000 phone calls in 1989 from dealers concerning state and federal regulations as well as crop production questions. The goal of all this effort is to assist farmers in the best crop production decisions possible.

The delivery system for this information is a computer networking system called AgriSource. AgriSource will link our entire 1,500 dealer network in 15 states to the agronomic information providers. Dealers and farmers have direct access to all product crop management technical and regulatory information currently available. AgriSource and its capability was demonstrated last year before the Senate Agriculture Committee. Additional information on AgriSource is attached to this statement.

Last, but certainly not least, we currently have over 300 professionally trained agronomists available to our local member cooperatives. The agronomist is supported with the latest technical information, land grant university research, computer system, regulatory requirements and ongoing training to ensure the products we market are used safely, efficiently and judiciously. Our goal is to enhance the professionalism and technical knowledge of the employees of our dealer members. We teach and test employees in courses in fertility management, crop production techniques, seed treatments and the use and regulation of crop production products. This year we have had over 980 people in our classrooms, our goal is 1,200. All this guarantees a science-based and environmentally safe approach to agricultural production.

We at the Agronomy Company of Cenex/Land O'Lakes believe our commitment to information gathering, information delivery and training to support the human expertise is second to none. We firmly believe our mission statement that we have to profitably market agronomic products and services within North America that enable farmers and ranchers to achieve maximum production efficiency and profitability. This will be accomplished with appropriate inputs for sustainable agriculture which is agronomically sound, economically sound and environmentally sound.

AGRISOURCE

WHAT IS AGRISOURCE?

AgriSource is a communication and information system for crop technology. It was developed on the foundation that numerous information providers are trying, sometimes with limited success, to get agronomic information to the agronomists and decision makers in our cooperatives in a timely manner. It was also developed on the foundation that coops and farmers often cannot get the up-to-date information they need when they need it. This situation creates numerous legal, professional, marketing and sales problems.

With the AgriSource communication network, Cenex/Land O'Lakes has gone to primary information suppliers and arranged for them to enter their information in a standard, organized format. A computer is installed at each information supplier to enter and maintain their data. Cenex/Land O'Lakes cooperatives are able to subscribe to this always up-to-date information system. To install AgriSource the user must provide a computer while Cenex/Land O'Lakes provides all of the AgriSource programs and databases.

HOW DOES IT WORK?

Each night a personal computer called "the Bridge" located at Cenex/Land O'Lakes calls the computer at each information supplier and checks for new information or changes in the old information. It brings this information down to the Bridge. All information is sorted at the Bridge based on geographic area (specific counties) and crop type (field corn, spring wheat, etc.) or account number that the information pertains to. The Bridge computer then calls the subscribing dealer and adds the new information to their database. Each coop only receives information specific to their crops and geography.

AgriSource is a very simple system. There are no mainframe computers, it is not an on-line system, each database is tailored to the specific dealer (the counties they serve and the crops they raise), and each dealer can use its computer all day for AgriSource or any other computer program. The only requirement is that each night the computer is set to receive new agronomic information.

CURRENT INFORMATION SUPPLIERS:

1. 17 primary Ag Chemical companies.
2 Centrol Soil Testing labs.
3. Cenex/Land O'Lakes Technical Service Department.
4. Cenex/Land O'Lakes Chemical and Plant Food Marketing Departments.

Cenex/Land O'Lakes is continuing to develop relationships with additional chemical companies, the government and other information suppliers to meet the needs of its users. AgriSource is currently only available to Cenex/ Land O'Lakes cooperatives but will be available nationwide in 1989.

CURRENT MODULES:

1. **THE CHEMICAL INQUIRY MODULE.** This module provides personnel making pesticide recommendations with access to standardized technical information on Ag Chemicals. The information is primarily derived from product labels and includes complete product use information. Using this tool the user can request lists of:

   a. All products registered for a specific treatment on a crop (e.g. Postemergence weed control in corn).

   b. All pests controlled by any of those products.

   c. All products registered for a specific pest in a crop.

   Once a product has been selected, the user has finger tip access to detailed application guidelines derived from product label and other information. All information is correct to the county level. Application guidelines have complete data on how to correctly use and handle each product alone or in a tank mix. This information is broken down into specific categories including: • timing, • product restrictions, • product rotation and feeding restrictions, • application feeding and rotation restrictions, • geographic restrictions, • application rates, • rate text, • method text, • environmental hazards, etc. It is a very powerful tool to have complete product use information in a standard format at your fingertips.

   Role of the Ag Chemical Company: Each Ag Chemical company is/has entered their product information in a standardized format on a computer. These companies are also maintaining their databases so all new product information or changes in old information are immediately passed on to the users. Each chemical company has a staff that approves and releases each piece of information. Dealers cannot modify this information.

2. **PLANT FOOD MODULE.** This module is for the personnel operating a fertilizer plant. It contains complete farm records and farm planning functions, including soil test recommendations for over 80 crops. In addition, the capability to formulate all types of dry, liquid and suspension fertilizers, maintain inventories, and invoice the sale are included in this package. The Plant Food Module is an excellent management, sales and marketing tool for the dealer.

3. **MESSAGE MODULE.** This module is currently used by the Technical Service,and the Chemical and Plant Food marketing and supply, and other agronomic departments to transmit overnight the latest sales and marketing, environmental and technical information to specific dealers or groups of dealers. For coops this is an excellent technical support, sales, marketing and management tool. Any group that has information to deliver to fertilizer and chemical dealers overnight could be part of this network.

4. **SOIL LOAD MODULE.** Results of a soil test are picked up by the Bridge from Centrol soils lab and transmitted automatically to the originating coop. This module will print out the results immediately or send them to the Plant Food Module where they can be saved on farm records and used in calculating an appropriate fertilizer recommendation.

5. **MSDS/SUPPLIES MODULE.** Each information supplier with this module can enter all products (books, fact sheets, supplies) and material safety data sheets they carry. Coops will only have the items important to their territory listed in their AgriSource computer. Cooperative personnel can use their AgriSource computer to order any of the supplies listed. Each night all orders are collected and delivered to the appropriate information supplier to be shipped the next day.

MODULES FOR THE FUTURE:

1. **SEED VARIETY SELECTION MODULE.** This module is designed to help agronomists select the appropriate crop variety for planting.

2. **PRICE SHEETS.** Will allow information suppliers to transmit the latest price sheets or similar information directly to groups of users.

FOR ADDITIONAL INFORMATION CONTACT:

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CENEX/LAND O' LAKES
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A SUSTAINABLE STRATEGY

Cenex/Land O'Lakes maps out a plan to help farmers optimize inputs.

Concern about groundwater contamination, excess chemical use, overapplication of fertilizer and food safety is raising questions about current farm practices. The call for change presents a significant challenge for farmers. But Cenex/Land O'Lakes Ag Services believes it has the answer.

"We want to balance the need for environmental safety with that of economic crop production," says Al Giese, vice president of Agronomy, Cenex/Land O'Lakes. "We are as committed as any environmental group to preserving resources."

Motivated by increased environmental worries, rising interest in Low-Input Sustainable Agriculture (LISA) and advancing technology, the cooperative is strengthening its efforts to help farmers maximize production while minimizing inputs. In developing a strategy, the cooperative sees a need for greater technical expertise.

"Ten years ago you could count off the number of corn and soybean herbicides on your fingers. You can't do that today," says Giese, who is also currently president of The Fertilizer Institute, a major industry organization representing fertilizer manufacturers and marketers.

Meeting the challenge

The co-op's answer is precision farming. "We want our dealers to work with each producer to develop the best management practices for the fields on his farm," Giese says. "We believe the successful dealer will be one who markets both agronomic products and knowledge."

He points to market research that shows as much as 80% of the farmers the cooperative serves expect to rely on their dealer for technical information in the future. "This puts the dealer at the forefront of information management for the farmer. And he'll need accurate information," Giese remarks.

Rather than simply ignoring the Sustainable Agriculture movement, the cooperative is meeting it by focusing its products and services on precision farming. Part of this position relies on the belief that both chemicals (called crop protection products by the co-op) and commercial fertilizer (now called plant food) will be necessary for a successful future. However, it may not always be needed and applied in the same quantities as in the past.

Changing and growing

The cooperative is strengthening its proven local services to help customers. In the case of Cenex/Land O'Lakes dealers, Croplan agronomists and Centrol consultants are filling that role.

These specialists are changing their focus from making broad general recommendations to more specific approaches. "The producer wants to know how a product will perform on his crop, on his farm, on each field," says Tom Larson, director of Agronomy services.

Both Giese and Larson comment that recommendations are much less likely to include chemicals for "every possible problem in a field," targeting specific problem solutions instead.

For example, in 1988 two farmers pocketed about $25,000 by switching from a blanket preplant herbicide program to a regimen based on spot treating only problem areas with a postemergence product. The producers are working closely with a Centrol consultant in making decisions. "These are sophisticated farmers who have accurately mapped weed problem areas in each field, but this is the kind of potential available to all farmers," says Larson.

Given this rapidly changing culture and the need to keep informed, how does Cenex/Land O'Lakes fill the knowledge void? AgriSource. The computerized information management system introduced in 1988 is currently located in more than 200 cooperatives representing about 60% of the business the regional co-op does in the field.

The system is being constantly upgraded with new "information modules" and existing modules are also being revised and enhanced. AgriSource allows a Centrol consultant or Croplan agronomist to perform complicated "what if" simulations with local customers to determine optimum recommendations.

Work determining yield goals and recommendations continues, with the ultimate objective aimed at getting the most production from the least inputs. "We know that product sales are what make us money," says Giese. "But if the technology changes the market and reduces the quantities of product required, and that benefits farmers economically, we'll adjust our business."— By Willie Vogt, Managing Editor. □

Increased training for local crop specialists and emphasis on knowing field specifics are keys to Cenex/Land O'Lakes' precision farming approach.

Senator Fowler. I will wait and ask you a couple of questions about that last sentence.

Dr. Jack Early, president of the National Agriculture Chemicals Association in Washington, DC. Thank you again, Dr. Early, for your patience.

Mr. Early. Thank you. I got on the right panel after, all, didn't I?

Senator Fowler. Well, we could have had you on any but we can give you plenty of time on this one.

STATEMENT OF JACK D. EARLY, PRESIDENT, NATIONAL AGRICULTURE CHEMICALS ASSOCIATION, WASHINGTON, DC

Mr. Early. Thank you, Mr. Chairman and Mr. Kerrey.

INTRODUCTION

We appreciate the opportunity to discuss with you this afternoon what we believe is the emerging public interest in resource conservation and new agricultural production practices.

Also, if it is acceptable to you, Mr. Chairman, we do have a rather lengthy written statement we would like to submit for the record.

Senator Fowler. I would like that.

Mr. Early. Mr. Chairman, as you know, a combination of factors, including agricultural commodity surpluses, rising farm program costs, and environmental concerns, has led to growing interest in reexamining the U.S. agricultural policy. We share this interest and support efforts by you and this subcommittee to enhance farm viability through economical use of off-farm inputs, including pesticides, as well as all other innovations in agricultural production and incentives.

Our testimony today is directed to a discussion of some of the future challenges of American agriculture and the role of agricultural chemicals technology. We address concerns about pesticides and the wide discussion of alternative production methods and low-input sustainable agriculture (LISA). We conclude our testimony with the observation that new agrichemical technology is a vital part of these innovative approaches in ensuring farm profitability, resource conservation, and environmental quality.

CHALLENGES IN AGRICULTURAL PRODUCTION

Despite the current domestic overabundance of certain commodities which threatens the economic viability of the Nation's farms, worldwide demand for U.S. food and fiber will continue to grow in the long run. To meet this future challenge, the U.S. agricultural community, with its finite land base, must depend increasingly on innovative crop protection chemicals and other measures to help protect and even increase crop yields at a lower cost.

THE ROLE OF AGRICULTURAL CHEMICALS

The invention of preemergence herbicides, for example, has created a technical revolution in the production of corn, soybeans, cotton and many other grain crops throughout the world. Yield increases resulting from weed control with these chemicals can range from 10 to 50 percent or more, depending on weed intensity. The value to the farmer and total dollar improvement to the U.S. farm economy from preemergence herbicides alone is in excess of $5 billion per year and is a major contributor to the spectacular increase in farm productivity over the past 20 years. These compounds are a major component of a rich resource of off-farm technology that work together.

CONCERNS ABOUT PESTICIDES AND AGRICULTURAL PRACTICES

The phenomenal productivity and other benefits achieved through the use of agricultural chemicals, mechanized agriculture, and other technological innovations, has also raised some public apprehension. Increasing attention has been given to the need for resource conservation and what some observers see as serious environmental, economic, and social problems associated with agricultural technology and related practices. Pesticides are obviously a very visible target.

We believe this public debate is healthy and are convinced that a fair and complete analysis based on science, not emotion, will justify a continuing, if not stronger role for certain chemical pest control inputs.

INTEGRATION OF AGRICHEMICALS AND LISA

Long-term economic viability and environmental protection in agriculture depends ultimately on both expanded use of better technology, and improved education, crop rotation, economic farm management, and integrated pest control. This combination of technology and good stewardship will help preserve the environment, provide low-cost food, and maintain the agricultural economy. Agriculture can only sustain its vitality if real production costs are kept down and are more than matched by the adequate return from crop protection.

In this important respect, the agrichemical industry is fully supportive of low-input sustainable agriculture. Obviously, the concept means many things to different people—you defined it this morning, Mr. Chairman, I heard—but to us LISA is a management system which uses inputs, both those available as natural resources on the farm and those purchased, in the most efficient manner possible to obtain productivity and profitability from farming, while at the same time minimizing adverse effects on the environment and public health.

The emphasis of new agricultural production methods should not be on just low-input goals and eliminating the use of synthetic fertilizers and pesticides. We cannot arbitrarily eliminate or sufficiently reduce off-farm inputs and still achieve the same level, quality and variety of food production our Nation enjoys today, and ensure the same protection of the environment and natural resources.

Agrichemicals are a vital part of these approaches to agriculture. For example, herbicides to control weeds on highly productive soil reduce erosion because less cultivation is required. Stubble mulch farming, no-till, ridge till, and other practices are well recognized for their beneficial effects on soil conservation.

CONCLUSION

In conclusion, Mr. Chairman, new technology and the use of pesticides are powerful tools, but if the goal of agricultural production is poorly defined, inefficiency and misuse of resources may result. Alternative farming concepts may provide a proper framework, so long as we remain sufficiently flexible to accommodate this technology. As we move forward in exploring these methods, we must continue to encourage new technology and not create artificial barriers, disincentives, or arbitrary limitations on agrichemical use.

Thank you for the chance to testify today, Mr. Chairman. I will be glad to answer any questions.

[The prepared statement of Dr. Early follows:]

TESTIMONY OF
DR. JACK D. EARLY
PRESIDENT
NATIONAL AGRICULTURAL CHEMICALS ASSOCIATION

BEFORE THE
UNITED STATES SENATE
COMMITTEE ON AGRICULTURE, NUTRITION AND FORESTRY
SUBCOMMITTEE ON CONSERVATION AND FORESTRY

JUNE 22, 1989

Mr. Chairman and Members of the Subcommittee, we appreciate this opportunity to discuss with you an emerging public interest in resource conservation and new agricultural production practices.

As you know, a combination of factors, including agricultural commodity surpluses, rising farm program costs, and environmental concerns, has led to growing interest in reevaluating the current emphasis of U.S. agricultural policy on production maximization. We share this interest and support efforts by you and this Subcommittee to enhance farm viability through economical use of off-farm inputs, including pesticides, and other innovations in agricultural production and incentives.

Our testimony today is directed to a discussion of some of the future challenges of American agriculture and the role of agricultural chemicals technology. We address concerns about pesticides and the wide discussion of alternative production methods and low-input/sustainable agriculture (LISA). We conclude our testimony with the observation that new agrichemical technology is a vital part of these innovative approaches in ensuring farm profitability, resource conservation, and environmental quality.

Challenges in Agricultural Production

Continuing world population growth and competition of foreign agricultural production will continue to be a major challenge for U.S. farmers. In 1985, the world's population was about 5 billion. By the end of this century, experts estimate that it will reach 6 billion, which reflects an annual growth rate of almost 2 percent. Using such figures, the Congressional Office of Technology Assessment has calculated that world-wide agricultural production must expand by at least 1.89 percent a year to meet the rising demand. According to the National Center for Food and Agricultural Policy, that expansion will mean a 2.3 percent yearly increase in U.S. grain exports, which translates into a total of 53 percent by the century's end.

Certainly, 53 percent is not as dramatic as the aggregate 300 percent growth that farmers here enjoyed during the 1970s. But the figures deserve a closer look. Throughout the 1970s much of the 300 percent growth was reached by putting more land under tillage and planting "fence row to fence row." One result of that supply expansion policy was that commodity prices on the international market flattened out, then fell sharply. By the early 1980s, we got to where we are now: According to the International Monetary Fund, real prices for major food grains in 1986 were 25 percent less than in 1970, after adjusting for inflation.

Unfortunately, falling international prices created an opportunity for countries that were able to under cut our production costs. The success of this strategy can be illustrated with a few statistics provided by USDA's Foreign Agricultural Service. From 1975 to around 1982, U.S. farmers supplied over 40 percent of the world's total wheat exports, mostly to the U.S.S.R., Japan, and Europe. Since then, however, our share has dropped to about 30 percent, while shipments from Europe have tripled and countries such as Argentina have emerged as major exporters.

My point is this: The rules have changed. If our farmers are to increase their exports 53 percent by the end of this century, as the experts tell us they must, or by an even greater amount as new markets are found, then we must provide them with cheaper, better technologies that will allow them to be more competitive and maintain yields. This message was clearly underscored by the Office of Technology Assessment, which calculates that 83 percent of the growth in worldwide demand for food must be met by improvements in yield, not by farming more land. And finally, we must develop better crop input tools with the objective both of increasing agricultural viability, and preserving the environment, energy, and other natural resources.

Despite a current general domestic overabundance of vital commodities which threatens the economic viability of our nation's farms, worldwide demand for U.S. food and fiber will continue to grow over the long-run. To meet this future challenge, the U.S. agricultural community with its finite land base must depend increasingly upon innovative crop protection chemicals and other measures to help protect and increase crop yields at lower cost. Further, utilization of these cost effective practices and tools often make the difference for many farmers between realizing a profit and potential bankruptcy.

Technological Innovation to Meet the Challenge

In the past, agricultural technology has responded to the need for greater yields and lower costs. Mechanical, chemical, and biological innovations have made the U.S. farmer the envy of the world: McCormick's reaper, John Deere's plow, Henry Ford's tractor, broad spectrum insecticides, new seed varieties, pre-emergence herbicides, and efficient plant nutrient systems.

This technology has helped make the U.S. a world leader in food production. In 1900, for example, one farmer produced enough food to feed 8 people. Today, the average farm supplies more than 80 people. Corn yields have increased from an average in 1930 of 40 bushels per acre, to over 115 bushels per acre today. In addition, because we have safer and more effective pesticides, we are able to store and export this surplus to a hungry Third World.

The Role of Agricultural Chemicals

Pesticides have made major contributions toward improving agricultural economics, increasing yields and relieving farmers of much of the past drudgery and dangers in agriculture. Agrichemicals are now an essential part of the farming business. Farmers use these products because their cost is more than offset by higher productivity, safety, better food quality, and increased profits.

The invention of pre-emergence herbicides, for example, has created a technical revolution in the production of corn, soybeans, cotton and many other grain crops throughout the world. Yield increases resulting from weed control with these chemicals can range from 10 to 50 percent or more, depending on weed intensity. The value to the farmer and total dollar improvement to the U.S. farm economy from pre-emergence herbicides alone is in excess of $5 billion per year and is a major contributor to the spectacular increase in farm productivity over the past 20 years. These compounds are a major component of a rich resource of off-farm technology that work together.

Good weed control programs can also prevent contamination of feed grains and hay with noxious weed seeds and foreign material, which results in excessive price discounts (dockage) and allows the spread of weed seeds from area to area when these farm products are sold or transported. Also, off-flavors in milk and other dairy products and deaths of farm animals from ingesting obnoxious or poisonous vegetation can be reduced.

Significant improvement in crop production and safety is gained if crops are free from weeds, diseases and insects. For example, a mechanical cotton picker or cotton stripper cannot operate efficiently in a weedy cotton field. Clogging of equipment by weeds and debris also exposes the operator to extreme danger when it must be unclogged by hand. Controlling allergenic weeds, such as ragweed and poison ivy, and curbing roadside weeds and brush with herbicides to improve traffic visibility, offer significant health and safety benefits to the public as well.

The search for compounds to control insects has lead to similar successes and public benefits. The agrichemical industry is developing powerful new weapons against insects as a result of our increased understanding of insect enzymes and hormone systems. For example, hormones which trigger stages of growth in particular insects can be synthesized and used to disrupt growth patterns. Molting inhibitors, insect behavior modifiers and other chemicals that interfere with larval development are just a few examples.

In recent years, one of NACA's members, a major pesticide producer, introduced a insecticide for use on vegetables which offered the farmer the ability to control pests within hours of application. This development enabled a very efficient, targeted application to be employed. In addition, the insecticide had low dermal toxicity and biodegraded rapidly. Some other insecticides then in use displayed very few of these characteristics. Over time, continuing research and development led to the insecticide's application on other crops including cotton, soybeans, fruit, wheat and tobacco. Breakthroughs such as this have enabled the farmer to effectively control various insects which reduce crop quality, salability and yields.

As significant as our past successes have been, much more needs to be done. We estimate that pests still destroy over 30 percent or $20 billion worth of crops annually in the United States. Without pesticides, the loss might reach two-thirds of our total production, as it does in many developing countries. Some African countries use production methods that have not changed for 300 years. Even after harvest, up to 60 percent of their crop can be lost to rodents and other storage pests. This unfortunate fact contributes greatly to the malnourished and starving millions that handicap the Third World. Yet, now the challenge is also to develop pesticides with lower environmental loading, biodegrade more quickly, are easier to handle and apply, and are safer to workers and the environment.

Concerns About Pesticides and Agricultural Practices

This phenomenal productivity and other benefits achieved through the use of agricultural chemicals, mechanized agriculture and other technological innovations have also raised some public apprehension. Increasing attention has been given to the need for resource conservation and what some observers see as serious environmental, economic and social problems associated with agricultural technology and related practices. Pesticides are a visible target; although also prominent are agricultural practices and other off-farm inputs that contribute to ground and surface water contamination, land erosion, drainage of wetlands, depletion of aquifers, and other possible environmental and economic dislocations.

Not surprisingly, farmers and others are questioning the role of current technology and practices in agriculture. We believe this public debate is healthy and are convinced that a fair and complete analysis based on science, not emotion, will justify a continuing, if not stronger role for certain chemical pest control inputs. Parenthetically, in this regard, only a small percentage of total farm expenditures now go to pesticides. In 1983, for example, U.S. farmers spent $18 billion for feed, $10 billion for machinery and repairs, $7 billion for fertilizer, and $4 billion for pesticides. This figure for pest control constituted less than 5 percent of all inputs, including labor, taxes, and land costs, on a per-farm basis. With demonstrated increases in productivity and in crop quality that such a relatively small investment makes, pesticides are already "low-input" in sustaining agricultural production.

Evolution of New Pest Control Technologies

Our industry is working toward new products that have the greatest potential for efficient agricultural production, with the least negative impact on the environment and public health. These technologies have already and will in the future help reduce soil erosion, ground and surface water contamination, and threats to wildlife. Examples of such beneficial technologies include:

- Biotechnology — Biotechnology has great potential for advances in agricultural pest control. A key focus is understanding interactions between hosts and pests so as to interfere with disease development and pest replication. The application of genetic engineering, to modify plants to resist insects and diseases, has already been demonstrated in the laboratory and has significant potential as a pest control strategy. Imagine a plant that could protect itself from insect pests by producing its own biological and highly specific insecticide — a protein that kills only certain pests and is harmless to people, animals, the environment and beneficial wildlife. A critical factor in the success of this technology will be its ability to develop products that can be used in normal application, be effective and priced competitively with traditional agricultural chemicals.

- Delivery Systems — Pesticide application and delivery systems are rapidly being improved. Delivery of products in non-living engineered cells should be available in two to three years. Living microbial delivery systems should be commercial by the late 1990s. Cloning of genes which code toxins into plants may be the ultimate delivery system, although this technology is several years from commercial reality.

  Mechanical application technology continues to advance. The development of rotary atomizers has reduced pesticide drift and amounts of "inert" carriers required for application. Vegetable oils, some from the crops on which the pesticides are applied, are increasingly being used as carriers. Finally, closed-systems (with virtually no waste or operator handling of concentrates), photoelectric triggers (where applications are targeted directly on foliage), wick applications (eliminating spraying and reducing environmental load), and computer-controlled flow monitors are all in' commercial use or development.

- Biological Controls — Production of botanical and new biological pest control measures should be available in the near future. One example is using modified beneficial microbes in soil to combat pathogenic varieties that cause plant diseases.

- Low-Volume Products — Concern over higher rate use of agrichemicals in crop production has resulted in the chemical industry's focus on discovery and development of new products which are effective at much lower application rates (ounces per acre instead of pounds), are less toxic, and which biodegrade quickly. Several major agrichemical producers are marketing herbicides that can be used at rates of less than one ounce per acre.

- Education — The agrichemical industry is increasing its focus on technology transfer to the farmer. Many of the production practice recommendations that the U.S. Department of Agriculture traditionally developed and communicated to farmers are also being offered to the farmer by agrichemical producers. One of NACA's members is using a computer network, tied to central data bank, to assist its customers on groundwater protection. This trend is likely to continue and expand as firms compete on service as well as product.

- Seeds and Crops — Pesticide and pest resistent qualities are beginning to be imparted into certain crops through protoplast fusion, micro-injection of genetic information into somatic cells, and mediated gene transfers. Such technology will allow pesticide applications at environmentally favorable times, and the reduction or elimination of certain pesticide applications altogether. Also, plant improvements in research by NACA's members include plants that can withstand extreme heat and cold without suffering damage, and plants that can tolerate too much or too little water, or salt water. Changes in the location and conditions of crop cultivation may assist in resource conservation and environmental protection.

- Packaging and Formulation — To reduce applicator risks and possible environmental impacts in pesticide handling and disposal, the industry is developing innovative ways to package pesticides. Water soluble containers and recycling through mini-bulk containers virtually eliminate contaminated container disposal. Efforts to standardize container shape, size and openings are facilitating closed-system operations that allow mixing of concentrates at the point of application, thereby reducing applicator exposure and waste. New pesticide formulations to improve worker safety and environmental protection include dry flowables, slow-release microprills, granulars, and dye-based formulations to improve application coverage.

Some of this new technology is basic research designed to learn how crops really grow and why herbicides and other pesticides work. Knowledge of fundamental biochemical processes at the molecular level has allowed the industry to design chemicals which have a high probability of interfering with a pest's vital functions and reducing application rates.

There has been a trend of discovery and commercialization of compounds of high unit activity. This development has been in large measure due to an increased understanding of biochemical processes, coupled with new computer programs. We are approaching the "tailor making" stage in some areas of crop protection chemical research. We will have compounds which are intricately designed to disrupt plant and insect processes at sites within these systems which will be unique to them. The resulting compounds should be less dangerous to mammals and more effective against the target insect, weed or plant disease. We've seen the emergence of highly active herbicides and insecticides which fit this profile.

We are also continuing to see high levels of investment in research and development as major suppliers expand their efforts in development of new products. In 1987, the U.S. agrichemical industry invested over $680 million, or about ten percent of revenues, on product research and development. Several companies, including BASF, DuPont, Monsanto, and Ciba Giegy, have recently built new laboratories for research and development in the U.S. These and other firms are also entering into joint ventures or contractual arrangements for outside research, including that done in cooperation with public universities. This research base is the key to future food supplies and environmental protection. Unfortunately, this level of research expenditure is becoming increasingly more difficult to justify.

The Challenge of Agrichemical Research and Development

Success in developing new pest control products is becoming more difficult. In the early 1950s, companies screened 2,000 compounds for each one introduced commercially. Today, the number is over 15,000. Stating it differently: hundreds of thousand of chemicals were tested for pesticide potential between 1972 and 1981, with only 80 new chemicals registered as pesticides in that period. It is a major challenge to find chemicals and other means that possess the unique ability to control a target pest without adversely affecting humans or the environment.

The magnitude of research costs can best be illustrated by the costs for a single new product. It generally costs $20 million to $40 million in research for a new pesticide. Some estimates place research and development costs as high as $70 million. By contrast, development of a pesticide in the late 1950s cost well under $1 million.

Likewise, the time to bring a new product to market has also increased substantially. In the period 1950-60 it took about three years to develop a new product (from first synthesis to marketing the approved product). This period increased to five years in the period 1960-70, seven years in the period 1965-75, and about ten years today. A recent study by NACA covering a 19-year time frame determined that five to seven years of the process is spent in registering a pesticide, i.e., from initiation of the first major health test until first registration.

A major contributor to these increases in cost and time is the research and testing required by Federal law. No pesticide may be marketed in the United States until the manufacturer satisfies EPA that the product presents no unreasonable adverse effects.

Our tests to determine safety and efficacy are much more sophisticated, time-consuming and exacting than they were even a decade ago. Today, Federal testing requirements under the pesticide laws may encompass hundreds, and sometimes thousands, of individual studies on health and safety effects, chemical residue and environmental fate. Most of these tests are not optional. They are explicitly required by Federal regulations, described in detail, with specific test protocols and laboratory practices. For example, such regulations require tests to determine acute toxic effects through oral, dermal and inhalation exposure, chronic toxic effects such as cancer, birth defects and reproductive harm, and the efficacy of the product. Detailed studies must be made of the possibility of residues remaining on the crop or in the animal, of effects on soil microfauna and microflora, and of possible dangers, either directly or indirectly, to fish, birds and other wildlife.

Many of these tests are quite time-consuming. For example, the minimum acceptable duration for certain chronic feeding and oncogenicity studies required by the EPA is 24 months. When tests to determine acceptable feeding doses, and the time required for data interpretation and report preparation are included, the overall time required for a single test may easily exceed three years.

The data from such testing is ultimately submitted to EPA for review during the final phase of the regulatory review process. It is not surprising that even this stage of the process may take one and one-half to two years. The volume and complexity of the scientific data submitted to the government in support of registrations is staggering. It is not unusual for a pesticide application to consist of 50 thousand pages. Over 200 scientists, technicians and administrators at EPA are involved in the review process. These individuals must keep up-to-date in the latest scientific developments in interpreting and evaluating test data. Moreover, not only do these individuals make certain our data satisfies the agency's rigorous scientific criteria, but in addition, they must also be able to satisfy the demands created by a growing public awareness and concern about chemicals.

Integration of Agrichemicals and LISA

Pesticides provide proven benefits to the public through low cost production of an abundant, healthful, and varied supply of food. Yet, simple reliance on pesticides and related technologies is not a substitute for good stewardship. Long-term economic viability and environmental protection in agriculture depends ultimately on both expanded use of better technology, and improved education, crop rotation, economic farm management, and integrated pest control. This combination will help preserve the environment, provide low-cost food and maintain the agricultural economy. Agriculture can only sustain its vitality if real production costs are kept down and are more than matched by an adequate return from crop production.

In this important respect, the agrichemical industry is fully supportive of LISA. Obviously, the concept means many things to different people. But to us, LISA is a management system which uses inputs (both those available as natural resources on the farm and those purchased) in the most efficient manner possible to obtain productivity and profitability from farming, while minimizing adverse effects on the environment and public health.

It is important to note what LISA is not. Sustainable agriculture is not synonymous with what some define as low-input farming. In fact, the phrase "low-input" is a misnomer, since when some inputs are decreased, such as chemicals and fertilizers, others inevitably increase, such as labor and machinery, while usually reducing output and profitability. True sustainable agriculture recognizes these trade-offs among inputs, and it is fair to say that sustainable agriculture is extremely management-intensive. Low-input means to us an increased sensitivity to the marginal returns and other costs and benefits of inputs and management techniques necessary to successful farming. It does not mean mindless elimination of off-farm purchases.

The emphasis of sustainable agriculture should not be on a "low-input" goal of eliminating the use of synthetic fertilizers and pesticides. We can not eliminate or significantly reduce off-farm inputs and still achieve the same level, quality and variety of food production our nation enjoys today. Wide selection and use of different pesticides is essential to reduce development of pesticide resistance, to keep prices as low as possible through competition, and to maintain crop yields and profits.

For example, a study from the Iowa State Center for Agriculture and Rural Development estimates that a switch to a low-input system would result in a 75 percent decrease in our supplies of corn and wheat. Further, a report from the Council for Agriculture Science and Technology, comparing organic and conventional farming, estimates that current grain-and-livestock farmers who switch to low-input systems would suffer a decrease in crop yields of up to a 25 percent. The report notes that if cash grain farmers switch to low-input methods, the decrease would be much greater. Even more troubling from the environmental perspective, the report concludes that such a change in agricultural practices would result in more need for land (with pressure on wetlands and wildlife habitat) and more soil erosion.

With LISA's focus on environmental and natural resource protection, moreover, agrichemicals are an even more essential ingredient. Herbicides to control weeds on highly productive soil reduce erosion, because less cultivation is required. Stubble mulch farming, no-till, ridge till, and other practices are well recognized for their beneficial effects. Some of these benefits are reduced soil erosion by both water and wind; increased rates of water infiltration into the soil, with less runoff; reduced loss of moisture through evaporation from the soil surface; reduced fuel, time, and labor requirements.

Also, a new type of pesticide — a bacteriostat that when added to ammonia-based or urea-based fertilizers retards their microbiological conversion to leachable nitrate — is lowering the chance of nitrate reaching groundwater. Thus, yields are enhanced by helping assure that applied fertilizer remains in the zone of root growth, while public health is protected by lessening the likelihood of nitrate loss.

Finally, along with USGS, EPA, USDA, and various state agencies, we are conducting extensive research on the conditions for products leaching into groundwater. This is an effort to collect physical, chemical, and biological data and other information that may indicate the potential for products to leach, as well as developing models for prediction and new pesticide products to avoid groundwater infiltration.

On the issue of groundwater protection, we would like to call your attention to an educational program intended to spread the use of best management practices and further public knowledge of groundwater protection principles. This program is called "ACRE," or the Alliance for a Clean Rural Environment. NACA is pleased to support the ACRE program, which is funded by about 20 manufacturers of agricultural chemicals. ACRE recognizes that usable information in the right hands is an important safeguard to groundwater quality and will help ensure that vital groundwater supplies beneath our farms and rural communities stay safe to drink.

The point is this: Obviously, there is no magical formula or absolute way for practicing sustainable agricultural. It depends on the crop, geographical region, available technologies, market opportunities, on-farm resources, weather, soils and many other variables. Pesticides may or may not have a role.

The successful farmer must manage these variables and all farm and off-farm inputs so as to practice sustainable agriculture for his or her unique situation. In very simple terms, it really comes down to management. Managing all the inputs so as to obtain maximum economic yields should be the goal. Each farmer must determine which inputs work best. There is no standard "cookbook" which describes sustainable agriculture for all farms, crops, soils, weather conditions, and market opportunities. In the long run, farmers who become low cost producers in the world market will manage their total inputs to improve their profitability. Computer technology now on many farms and in the hands of agrichemical salesmen and dealers help farmers manage these decisions in an effective and timely manner.

Conclusion

In recent years, the public and agriculture are beginning to look at productivity with a broader perspective. Lower operating costs, preservation of natural resources, and sustained yield have become as important or more important as maximum yield. New technology and the use of pesticides are powerful tools, but if the goal of agricultural production is poorly defined, inefficiency and the misuse of resources may result. Perceived shortcomings in agricultural policy may have more to do with faulty or inadequately designed goals, than with the technology we have developed and applied. LISA concepts may provide the proper framework, so long as they remain sufficiently flexible to accommodate this technology. As we move forward on alternative agricultural production methods, we must continue to encourage this new technology and not create artificial barriers, disincentives, and arbitrary limitations on use.

Senator **Fowler**. Thank you, Dr. Early. Senator Kerrey and I will have some questions right after we hear from Mr. Jake Redmon, our friend and president of the Agricultural Chemicals Association of Georgia—the last Georgian but one of the best. Welcome, Jake.

STATEMENT OF JAKE REDMON, PRESIDENT, AGRICULTURAL CHEMICALS ASSOCIATION OF GEORGIA, ON BEHALF OF THE NATIONAL AGRICHEMICAL RETAILERS ASSOCIATION, BONAIRE, GA

Mr. **Redmon**. Thank you.

INTRODUCTION

Mr. Chairman and members of the subcommittee, as a retailer of agrichemicals I welcome the opportunity to comment on current production practices as they relate to the research and conservation measures regarding low-input agriculture. I am the manager of Houston Fertilizer and Grain in Bonaire, Georgia. I am on the front line with farmers each day, directly involved in their operations from both the selling and buying point. Their farming operations directly affect our business each day. I am also president of the Agricultural Chemicals Association of Georgia and treasurer of the National AgriChemical Retailers Association, NARA, based in Alexandria, Virginia.

IMPORTANCE OF AMERICAN AGRICULTURE

As an industry, U.S. agriculture today accounts for more than 20 percent of American jobs, approximately 17 million, and 20 percent of our gross national product. Currently, one farmer in the United States feeds an average of 79 other people, due in large part to agrichemicals, fertilizers, machine technology, and a concerted and well-thought-out research effort. Farmers now grow 80 percent more per acre than their parents did on the farm just one generation ago.

I feel that in recent months, the enormous benefits that pesticides provide to the health and welfare of our country, as well as to the entire world, have been overlooked.

IMPORTANCE OF PESTICIDES TO AGRICULTURE

About 93 percent of the world's total food production comes from plants. Competing for the same plants that feed us are approximately 150,000 species of insects, bacteria, fungi, weeds, and higher organisms.

About 37 percent of the world's food crops are destroyed each year by these pests.

Before the American Government calls for a possible reduction in the use of pesticides through legislation mandating the use of low-input agriculture, we must take a serious, long-term look at low-input agriculture and see if it will work.

LISA

Many of the farming practices regarding low-input agriculture are already being used today to some degree by a farmer when they fit into his operation. However, many questions remain to be answered regarding low-input agriculture. Questions regarding just how farmers are going to combat weed infestations is one, for example. Even though one of the guiding principles of low-input agriculture is to further reduce soil erosion, we must raise the point that with the increased cultivation required for weed control under LISA, with lowered chemical use, you will eventually see an increase in soil erosion. This misguided logic could possibly destroy, not help, the environment we so want to protect.

We feel that certain production practices contained in the low-input production philosophy, such as Integrated Pest Management (IPM) and Best Management Practices (BMP), are positive steps in the right direction. I believe that integrated pest management allows farmers to wisely use chemicals through accurate insect identification and timely application. However, many producers have been slow to adopt IPM because it requires greater management time and skills.

Blanket reduction goals are not economically sound. For example, spider mites—and they have been mentioned today—are not a problem every year in Georgia peanuts, however, under droughty conditions they can destroy a crop overnight. Mandated reduction in pesticide use may allow for total crop loss. The goal should be wise use of pesticides as needed.

We recognize that problems do exist regarding soil erosion, food safety, and ground water quality, that must not be ignored. However, we cannot abandon those practices that produce our abundant, high-quality food supply before we have a proven replacement system.

THE AGRICHEMICAL RETAILER VIEW

As agrichemical retailers, we are a service industry, vitally concerned about the success of American agriculture.

Because of the high cost of agrichemicals, retailers have seen first hand the reduction in the use of pesticides on the farm. Farmers now use a minimum amount of pesticides, and we believe will continue to decrease their use as they utilize IPM and Best Management Practices. A good example is, when soybeans went to $5 a bushel a couple of years ago, farmers greatly reduced their inputs, not only chemicals but also fertilizers, because of the economics.

I would like to point out that NARA generally supports conservation practices regarding wetlands protection, sinkholes, and well testing. However, such issues as the privacy of well test results and what level constitutes a contaminated well must be addressed. NARA and the Agricultural Chemicals Association of Georgia look forward to working with this committee in order to determine the effects of these possible programs on farms as well as the agricultural input sector.

SUMMARY

In summary, agricultural chemical retailers believe that future agricultural legislation should call for further research and education on low-input agricultural practices, not mandate their use. Thank you for the opportunity of allowing me to speak, and I will be glad to answer any questions.

[The prepared statement of Mr. Redmon follows:]

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TESTIMONY
OF
JAKE REDMON
ON BEHALF OF THE
NATIONAL AGRICHEMICAL RETAILERS ASSOCIATION
AND THE
AGRICULTURAL CHEMICALS ASSOCIATION OF GEORGIA
BEFORE THE
SUBCOMMITTEE ON CONSERVATION AND FORESTRY
OF THE
COMMITTEE ON AGRICULTURE
UNITED STATES SENATE
CONCERNING
AGRICULTURAL RESEARCH AND CONSERVATION MEASURES
REGARDING LOW INPUT AGRICULTURE

JUNE 22, 1989

Mr. Chairman and Members of the Committee, as a retailer of agrichemicals I welcome the opportunity to comment on current production practices as they relate to research and conservation measures regarding low input agriculture. I am the manager of Houston Fertilizer and Grain in Bonaire, Georgia. I'm on the front line with farmers each day, directly involved with their operations from both the selling and buying side. Their farming operations directly effect our business each day. I am also President of the Agricultural Chemicals Association of Georgia and Treasurer of the National AgriChemical Retailers Association (NARA), based in Alexandria, Virginia. NARA is an independent national trade association of retailers whose members represent 80% of the total agricultural pesticide sales in the United States.

I. Importance of American Agriculture

As an industry, U.S. agriculture today accounts for more than 20 percent of American jobs, approximately 17 million, and 20 percent of our gross national product. Currently, one farmer in the U.S. feeds an average of 79 other people due in large part to agrichemicals, fertilizers, machine technology and a concerted and well thought out research effort. Farmers now grow 80% more per acre than their parents did on the farm just one generation ago. (USDA 1988).

I feel that in recent months, the enormous benefits that pesticides provide to the health and welfare of our country, as well as the entire world, have been overlooked. This concerns us in the retail industry, and we feel that the importance of pesticides and their use should be brought to mind.

II. Importance of Pesticides to Agriculture

About 93 percent of the world's total food production comes from plants. (Briskey, Hays, Mitchell 1983). Competing for the same plants that feed us are approximately 150,000 species of insects, bacteria, fungi, weeds, and higher organisms (Ware 1983).

About 37 percent of the worlds food crops are destroyed by these insects, plant pathogens and weeds during growth, harvesting, and storage each year (Pimental 1987). Over time, man has found that agrichemical pesticides are currently our best defense in the daily battle against all of these competitors.

Studies have also shown that pesticides can greatly increase production of agricultural crops, therefore reducing the risk that farmers take and insuring a stable food supply. One study conducted in the corn belt states from 1964 to 1979 showed that increased use of herbicides accounted for a 20 percent increase in corn yields (Schroder, Headley, Finley 1982). Other studies verify this point.

Pesticides have also proven over generations to be not only yield enhancers, but also lifesavers. For example, the potato famine in Ireland was caused by a fungus blight from 1845 to 1851. This fungus destroyed the Irish potato crop, causing an estimated one million people to die of starvation and forcing another million to emigrate. Now, in addition to resistant varieties, pesticides are available to control the blight (Ware 1983). Even today, the European Economic Community is very reluctant to do away with farm subsidy programs because of the memory of the millions who starved over one hundred years ago.

Before the American government calls for a possible reduction in the use of pesticides through legislation mandating the use of low input agriculture, which would reduce the ability of American farmers to combat pest attacks such as the recent invasion of the Russian Wheat Aphid, we must take a serious long term look at low input agriculture and if it will work. The Aphid currently posses a threat to 53.6 million acres of U.S. wheat (Meyerdirk 1989).

III. Low Input Sustainable Agriculture

LISA, low input agriculture, is a production practice which calls for crop rotations, crop and livestock diversification, soil and water conserving practices, mechanical cultivation, biological pest control and lowered off-farm inputs of chemicals and fertilizers. The purpose of which is to protect our soil, groundwater and environment.

Many of the farming practices regarding low input agriculture are already being used to some degree by farmers when they fit into his operation based on soil type, slope, cultivation practices, crop variety, farm economics and the weather. However, many questions remain to be answered regarding low input agriculture. Questions regarding just how farmers are going to combat weed infestations is one for example. Even though one of the guiding principles of low input agriculture is to further reduce soil erosion, we must raise the point that with the increased cultivation required for weed control under LISA with lowered chemical use, you will eventually see an increase in soil erosion. This misguided logic could possibly destroy, not help, the environment it so wishes to protect.

Some may say that conservation tillage may be the answer to the tillage and weed problem associated with low input agriculture. However, a recent report to the Honorable Jamie Whitten, Chairman of the House Committee on Appropriations regarding low input agricultural research, indicated that conservation tillage makes soils cooler and therefore results in increased carry-over of disease and insects in some areas (Kemper 1989). Farmers currently have no other viable tool to combat these diseases and insects except through the use of chemical pesticides. This dilemma as well as many others regarding low input production practices need to be answered before we change our nations farm policy to require the adoption of this and other practices.

We feel that certain production practices contained in the low input production philosophy such as Integrated Pest Management (IPM) and Best Management Practices (BMP) are positive steps in the right direction. I believe that IPM allows farmers to wisely use chemicals through accurate insect identification and timely application. However, many producers have been slow to adopt IPM because it requires greater management time and skills (Knowles 1988; McNeal 1988). IPM has been adopted quicker on high value crops such as vegetables and fruit rather than on lower valued crops such as corn and soybeans. When soybean prices dropped to five dollars per bushel my farmers discontinued crop scouting, an essential component of IPM. They also reduced inputs of fertilizers and chemicals. More research needs to be done regarding these new sciences to determine how they can best work in a farm production program guided by agricultural legislation while at the same time taking into account general farm economics.

Congress must make sure that if they require farmers to use such techniques as IPM and Best Management Practices to stay qualified for government program payments, that farmers have the flexibility to use those practices adaptod to his area and crops.

Congress should not mandate a percentage reduction in pesticide use. Such blanket reduction goals are not economically sound. For example, spider mites are not a problem every year in Georgia peanuts, however, under droughty conditions they can destroy the crop. Mandated reduction in pesticide use may allow for a total crop loss. The goal should be the wise use of pesticides as needed.

We recognize that problems do exist regarding soil erosion, food safety and groundwater quality, that must not be ignored. However, we cannot abandon those practices that produce our abundant, high quality food supply before we have a proven replacement system. Basic low-input agriculture research began in earnest only 16 months ago when Congress appropriated the first of $8.35 million dollars in funds for research. Only 53 sustainable low input agricultural studies are now underway, and it will be years before they yield proven and meaningful results that would prove workable through possible standards set forth in low-input agricultural legislation (Madden; O'Connel 1989).

IV. The Agrichemical Retailer View

As agrichemical retailers, we are a service industry vitally concerned about the success of American agriculture. Our livelihoods depend greatly on the decisions you make here in Washington regarding the direction of our government farm policy.

Already, farmers in this country have begun to adopt low-input practices such as reduced tillage on their own. For example, it is believed according to one study that 65 percent of farmers will voluntarily adopt reduced tillage practices by the year 2000 (Flynn 1989).

Because of the high cost of agrichemicals, retailers have seen first hand the reduction in the use of pesticides on the farm. Farmers now use the very minimum amount of pesticides and we believe will continue to decrease their use as they utilize IPM and Best Management Practices. However, we believe that low input production technology is currently not advanced enough for its mandated adoption under future legislation such as the 1990 farm bill.

I would like to point out that NARA generally supports conservation practices regarding wetland protection, sinkholes, and well testing. However, such issues as the privacy of well test results and at what level constitute a contaminated well must be addressed. NARA and the Agrichemicals Association of Georgia look forward to working with this committee in order to determine the effects of these possible programs on farms as well as the agricultural input sector.

In summary, agrichemical retailers believe that future agricultural legislation should call for expanded research and education of low-input agricultural practices, not mandate their use. When it can be proven to be both economically and environmentally sound, farmers will eagerly adopt these practices without the need for more Federally funded programs.

Thank you for giving me the opportunity to testify regarding low input agriculture. At this time, I would be happy to answer any of your questions.

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Senator **Fowler**. Thank you very much, Mr. Redmon.

Dr. Early, in your written testimony—and I do appreciate your summary—you wrote, did you not, of some examples of some spectacular yield increases due to herbicides controlling weeds. Tell me what you know about the incidence of resistance to the herbicides. You know, we have had some testimony, not this morning but in other hearings. Some weed scientists believe that the phenomenon of resistance is worse on weeds than it is or ever was on insects.

Mr. **Early**. Well, I might challenge that just a little bit, Mr. Chairman, because I think you have a little different concept. When we look at the insecticide area where we have—let's use house flies or flies, for example—where you have maybe hundreds of generations a year, so with each generation you have an opportunity to build up or increase that resistance factor, with that many populations. Usually with weeds you have probably one crop of weeds a year.

I think usually when we talk about weed resistance, I really believe a lot of us are talking more about the selection of weeds, about changing weed populations. An example: Suppose you have a herbicide that is a great herbicide for controlling a certain kind of weed but not other weeds. As you continue to control that particular weed, then the other weeds are going to have less competition, so you might have a different type of population of weeds. So I am not so sure in my own mind that we are talking about resistance as much as we are talking about changing populations and types of weeds in the crop.

Senator **Fowler**. Well, I don't have that in front of me, though there are, I think, two or three or six or eight sides to this, I realize. I guess my point is that your statement, what made me think of it is your statement that herbicides are a major contributor to the increase in farm productivity over the last 20 years. I don't have any problem with that, but that may not hold, let's say, for the next 10 years, if resistance in individual weeds removes the effectiveness of the chemical on that individual weed.

Now you are saying that may not be the case, but I do think that some people are saying it is. So if that is the case, I think I know the answer, but just to pursue what I was thinking, I just wondered whether or not the industry is involved in your own research on how you overcome the development of this resistance, if it is true. If you don't believe it is true, obviously you have to say you don't believe it is true.

Mr. **Early**. No, I think what I am saying is that herbicide A may do an excellent job and did for maybe 10 years in a certain area, and because weed populations have changed in the last few years, that a new herbicide has come in and is doing a better job now because it is controlling those weeds that were not controlled originally by herbicide A. That is really what I am saying.

You know, the only things that we must recognize about——

Senator **Fowler**. Do you not have examples of where weed A, which used to be controlled by herbicide A, is no longer responding to herbicide A but is developing some serious resistance to it?

Mr. **Early**. We could try to find some examples. I don't know of any specifically, but let me see if we can find some and make them available to you.

One of the things we must keep in mind on herbicides is, when we talk about increased yields, what we are really doing with herbicides is allowing the plant to produce its maximum yield. Herbicides don't necessarily increase the yield per se, but create a climate in which you can have maximum yields——

Senator **Fowler**. Right.

Mr. **Early** [continuing]. As opposed to fertilizer which may add more nutrients, and I think that is certainly understood by all of us. So when we say we increase yields, all we are doing is allowing the plant to produce its maximum yield, is what we are doing, by protecting it from other competition.

But let me see if we can find some examples of that area from some of our scientists. I am not personally aware of some of those.

Senator **Fowler**. Yes. Well, I will see if I can help you, too.

Mr. **Early**. I am advised by Mr. Beck there may be some triazine-resistant areas that maybe he could respond to, then.

Mr. **Beck**. I think that is probably the hottest research topic going right now, is the triazine-resistant weed species, and that is the one that has come to the forefront most, so I would assume that if you have been listening to the researchers, that is the one topic that has major concern right now. If it is for triazines, then we have another whole family of herbicides that may be developing that same problem. That is the tip of the iceberg on that one.

Senator **Fowler**. Dr. Beck, have you seen a change in the—you were talking about your staff and the quality of people that are working with you—have you seen a change in the focus of agronomists toward a more, for lack of a better term, environmentally minded approach to production?

Mr. **Beck**. Yes, we have seen a tremendous interest from growers, because obviously as the economic squeeze comes in, their demand then is the questions that come in to us: Given a choice between two different products, which is my best choice? The first question they generally ask is, which one is going to give me control? If two herbicides then give the same level of control, then the next question is, which one is my best buy?

So the agronomics ofttimes drive that, but I guess basically in the sixties and early seventies when we were going gung ho, some of the things were not necessarily—prices were relatively good during that time. There were a lot of people in our area that bought equipment and paid off loans and things like that, so it wasn't nearly as important as it has been here in the eighties. That push for agronomy research that is indeed taking a look at the economics is becoming a very important change.

The other big change that comes about is the move from the ag chemical side, from a preplant broadcast application of a herbicide to control what I think might be out there, we are moving now to more postemergence applications, where we put on the herbicide necessary to control the weed that we have identified that is out there, and that is a dramatic change.

Senator **Fowler**. Rather than initial spraying as a coverall?

Mr. **Beck**. Yes, so rather than an insurance policy, it is a rescue treatment, but it becomes very specific then as to whether I can control that weed at the three-leaf stage. Once it is to five-leaf, I may start damaging the crop and not control the weed, so it becomes a very tight management requirement to spray only when needed, as opposed to the broadcast approach.

Senator **Fowler**. Jake, what areas do you think that the Government ought to be or USDA specifically ought to be looking into, in its efforts to better educate farmers about appropriate fertilizer and pesticide use?

Mr. **Redmon**. I was kind of astounded with the figure you gave out a while ago, that the farmer got 85 percent of his information from the dealer. I kind of feel like I need to go back and raise my prices a little bit. [Laughter.]

Senator **Fowler**. Maybe you just ought to raise the quality of your advice. [Laughter.]

Mr. **Redmon**. Touché. I do feel like farmers do come to the dealer, and one reason that they come to the dealer is because the dealer has a financial interest in it with them. We sit down with most of our farmers each year and work out a management plan for the entire year. Our local Extension Service—and I don't want to berate the Extension Service, I think the mechanism that we have established today with the USDA, the Research Service and the Extension Service, this was a system set up many years ago that has worked and really brought agriculture where it is today, but I think they have kind of lost some direction, especially at our local level, where they are getting away from being agricultural agents. I kid my agent about being an urban agent because we are becoming urbanized in our area, but he has so many more duties to do than look after agriculture at this time.

Senator **Fowler**. Like what?

Mr. **Redmon**. We just went through a big study last year where our agent spent a lot of time—and I will probably go home and get crucified—working on Houston County 2000, which included, in our area, with Warner-Robbins Air Force Base, agriculture is a very small percentage.

Senator **Fowler**. Looking at Houston County and what it is going to need in the year 2000——

Mr. **Redmon**. What it is going to need in the year 2000.

Senator **Fowler** [continuing]. In the way of health service, education service——

Mr. **Redmon**. And if you stop and you look, that was when I realized they did so many more services and provided service in the county other than agricultural service. Now generally in our area the Extension Service has a good reputation.

But farmers, you were talking about your grandfather, you can group farmers into those that take initiative on their own; then you have those that are going to be quick to follow when a new idea comes about; and then you have one segment in the back that may never change. You know, they farmed like that in the thirties and they are going to farm like that until they quit, in any area that you have.

Once you prove to a farmer, though, that he can make money at it, I have never seen one that wouldn't jump on it. They come to me, like Dr. Beck was talking about, first wanting to know what will do the job, what is the cheapest.

Senator **Kerrey**. Some of those guys that didn't make any changes and jump on it were the only ones making money in the eighties.

Mr. **Redmon**. Well, I related that we have cut back on fertilizer and chemical use, and it has been brought out here, since there were a lot of people from Georgia here, our soils in Georgia are low in nutrients. Dr. Waters with Water Labs in Camilla, I was talking with him, and they are monitoring all of the soil tests that he does. The USDA is getting the figures, and they have come to realize we do not have overfertilized soils in Georgia. They are underfertilized. If you saw my sales figures back during the mid to early eighties, you would realize they were greatly underfertilized.

Senator **Fowler**. Well, I do, Jake—and then I will turn it over to Senator Kerrey and let him ask some questions, make some comments—but I do want, because you have been so helpful in reviewing what we have been trying to do and making very good suggestions—I get in 10 times more trouble than you but I am hired out to do that. You know, I understand that the Farm Bureau thought I was rough on them this morning. I wasn't trying to do anything except explain what we are trying to do, and I want to repeat it to you because in your testimony—nobody is mandating anything. We know that the farmer is the one that wants to have the best food at the lowest cost to him. If he can use less fertilizer, even though it will hurt your business, he is going to do it if he can get the same yield.

What we are trying to do is, with all this research that is continuing, yes, private and public, but there is nothing new about this, as we were talking this morning. There has been a lot of research and a lot of application around the country that we have all gone around and looked at, where there are some techniques that we think can be helpful if they will voluntarily try them.

Mr. **Redmon**. One of the reasons the farmers in our area have not jumped on this—and here again we are a little different than a lot of Georgians, in that we are wheatsoybeans. Wheat planted, double-cropped by soybeans.

Senator **Fowler**. Right, right.

Mr. **Redmon**. The wheat program in the eighties, with the PIK payments and so forth, it's hard to get crop rotation into our land. There is probably less than 2 weeks out of the year that there is not a crop growing on that land, and that is just the in-between times of getting it harvested and getting it planted. Our farmers—the wheat prices have been fairly up, even though soybean prices have fluctuated—they are not going to give up a crop that they are making money on to go into the Government program.

I feel like on Government programs, as long as I am stating this, that the farmers will put these into the reserve programs and get into the programs when commodity prices are cheap. You let commodity prices hopefully, not let, but hopefully they get up, they will take it right back out of reserve and put it back into production.

Senator **Fowler**. Right.

Mr. **Redmon**. A lot of our land is rented, also. This may be uniquely in our area. When they are paying up to $40 or $50 an acre rent, it's hard to put it in set-aside or put it in rotation, when there is not a crop that is bringing in money on that rotated land.

Senator **Fowler**. That is a very helpful observation. I understand that. But again, and Dr. Early knows, I am sure, we have communities now—California seems to start everything, I know they are doing it in California, and some other places—where they are proposing taxing all pesticides, using the revenues from the tax to do the research on the harmful effects of the chemicals.

Well, let me just ask, Dr. Early, what are you all doing about that? Has the industry got a position to——

Mr. **Early**. Obviously we don't support that.

Senator **Fowler** [continuing]. Alternative to that type of approach?

Mr. **Early**. Some of these issues are becoming increasingly difficult in the States, not just California but other States, too, and we have a lot of concerns with some of the developments moving out there where we have to—I will use the term "pay for our own demise" out there, if you will. It is a very troublesome situation, because it bothers me to have to pay taxes, a mill tax or that sort of thing, out of our funds to go out and do something to—and I will overexaggerate a little bit—put us out of business. I think that is a little bit unfair.

Don't get me wrong. I am in favor of research and integrated pest management and all these issues, but I think it has to be done in a way of balance.

Senator **Fowler**. Well, I do have a middle ground for you here, for your consideration.

Mr. **Early**. Is that a piece of legislation?

Senator **Fowler**. This little bill here with my name on it. Would you like——

Mr. **Early**. I have looked at that very carefully, Mr. Chairman, yes.

Senator **Fowler**. I appreciate that. It might be a middle approach, again along voluntary lines.

Senator Kerrey.

Senator **Kerrey**. Mr. Beck, you made a statement, and I assume that both Mr. Early and Mr. Redmon have seen it. There are, you said, fewer agronomists. In Nebraska there are a disturbing number of parents who are saying to their children, "We advise you not to go into agriculture," because the financial incentive is not there quite like it used to be. How do you see the chemical industry playing a role in trying to assist farmers in making that profit? Is it only on the production side?

How do you see the outlook for the chemical industry in the 1990's, all three of you? I see forecasts of 53 percent growth in demand in the 1990's, but it seems to me that it is not likely to be more of the same. It seems to me it is likely to be significantly changed, and I think the role of Government is going to be significantly changed. At least it is going to be significantly changed on the research side. I would just like to hear your view of what the nineties look like.

Mr. **Beck**. Yes, what you mentioned is extremely true, that people have been directed out of agriculture as a career path. On the other hand, I think one of the reasons for that has been the stresses that have occurred out there and the fact that in our mindset, rural America only is owner-operator. I mean, as long as we have that mindset, that the farmer who owns the land and operates it is the only option for agricultural careers, then we have a real problem.

What we have done as an individual company is tried to get people to recognize there are a lot more opportunities. The consulting situation, in 1981 when we started consulting, we started with 10,000 acres under contract. Right now our independent crop consultants, the Centrol that Mr. Tonsager from South Dakota mentioned—he is a subscriber, some of his acres are subscribed—we are over 1.2 million acres under consulting right now. That is a dramatic increase, and there are an awful lot of opportunities for that.

That allows you to do part of the production game, but from a consultant's standpoint. You have a financial risk associated with that individual. You become the partner.

In Wisconsin, for example, in the dairy program, those dairy farmers, most of them are extremely good animal scientists. They are not quite as good an agronomist, because when you are trying to take care of that cow, what you need to do is direct all your inputs into management of that animal. Now you need to get feed from someplace, and what we are starting to see is more divisions, fewer people growing their own feed and then contracting that feed with someone else, so there are more opportunities.

In the research game there are some super exciting things that are coming on. We need plant physiologists. We need people in research. The classes of herbicides we are coming down to, we are trying to identify when is chlorophyll formed in a weed. If it is formed at a different time of the day than in the crop we are trying to protect, then we have a window of opportunity to apply a chemical that has 6 hours of longevity, safe to the crop because not affecting its chlorophyll.

So we have some basic research needs. There are tremendously exciting things to be done, but for some reason we don't include that in the story of agriculture as a career path.

I get extremely disgusted with some of the advertisements that the chemical companies put on TV to advertise their products, but you have to commend two groups that have done a nice job of talking about agricultural careers. Dow has done a nice job, if you have seen any of those advertisements of careers in agriculture, and Ciba/Geigy has done some decent ones with how are we relating to the land and trying to build some confidence, but we have some real duds out there as commercials.

In the Minneapolis/Twin Cities area we have basically gone on record as saying, "Do not put those advertisements on TV," because who is your population base? You are getting nonsense ads. The weed crawling up and cutting down a telephone line to keep the consultant from talking to the farmer, that is not accurate, it is not valid, and it is really condescending to the grower, too.

So there are a lot of exciting things going on, but we never get that message out.

Senator **Kerrey**. Well, I appreciate that advertisers need to condescend to the purchaser. They do it in practically every marketing scheme that I have ever seen. I mean, we rarely assume that the buyer is an enlightened human being when the ad is being produced.

But I guess what I am trying to focus on is this marginal increase in productivity and the cost of that marginal increase in productivity. It seems to me that over and over I am hearing from people at home that they are very much concerned about the environmental issues and responding to them. Which brings up the question: How do you think we ought to be regulating you? One way or the other, we are going to regulate you, and I would like to have your opinion as to how we ought to do it.

I am concerned because I want to make certain that I take the correct policy action, both with the farm program and with research, so we can create an environment in which my producers can be profitable, because in the end they are there to make a profit. They are there to make a profit.

I certainly witnessed in the late seventies and the early 1980's, policies, public and private, that in fact encouraged everything but profit, which is why I jumped in and said a lot of the guys that didn't accept the new are the ones that made money in the 1980's. They are the ones that weren't leveraged. They are the ones that looked at cash-flow, not at the increased value of the land.

There were a lot of people, and I am sure you were in the midst of it, saying, "Don't worry about cash-flow, because the increased productivity of your land is going to increase the value of your land, and that is where your real wealth is." Of course, that turned out to be fool's gold.

Mr. BECK. Yes, a lot of people believed that.

Senator KERREY. What is your picture of the 1990's and how you operate in that, as far as trying to assist farmers to be profitable?

Mr. BECK. One key thing is, Alliance, Nebraska, for example, has bought onto some of the newest technology that exists in the ability to variably apply chemicals and fertilizer, with a fertilizer spreader that can blend on the go, in the field. Based on a soil sample that has been taken every 400 feet in a grid pattern, every 60 feet I can completely change the blend of nitrogen, phosphorus, potassium, micronutrients, based on a soil test, not a guess, not an average for the whole field.

Now I can start farming by the square foot, so if you regulate me as to how much I can put on as a total amount of fertilizer, then that practice becomes even more important because I am going to apply more fertilizer in those soils that can produce more and less where they can't. With present technology, we put the same rate of herbicide over the whole field, put the same rate of fertilizers over the whole field. This being able to customize down, it is called "farming by the foot," and if you have not had a chance to look at the March issue of Farm Journal, there is an excellent synopsis of what is going on.

Senator KERREY. Let me drop down to something a little more narrow. Yesterday we heard William Marshall with Pioneer Hybrid talking about half a dozen—five, actually—priorities for research. One of the pieces of it was to make sure that the research was size-neutral. I mean, do you accept that as an important ingredient of your effort to try to market your products?

Mr. **Beck**. For us it becomes extremely important because, as a cooperative, we have to have equal opportunity for all growers, whether they be large ones or small ones, so it is extremely important to our dealers. I think that it would probably be the same in your case. It has to be size-neutral.

Mr. **Redmon**. Right. I would like to reiterate, it has to be down to where each farmer is going to have to adapt for his management skills. It really comes down to the farmer's management ability, and for those that have been in agriculture—I have just been in it a short time, compared to others here—the farmer, the key is his management ability nowadays, for him to make that profit that you were talking about, for him to make these reductions in pesticides, these reductions in fertilizers.

Fertilizer banding is a big thing coming in our area. I think what Dr. Beck is talking about gives a fertilizer dealer nightmares, that truck out there that is going to change that fertilizer formulation every 60 feet, but banding is something that the entire fertilizer and chemical industry has looked at and really promoted, and this has really reduced the amount of pesticides and fertilizer that is being used. I think the plants are better utilizing them, also.

Senator **Kerrey**. Are you suggesting, though, that there has been an attitude change on the part of chemical people that says that we know that we can't just simply go out and aggressively push increased applications of chemicals for the purpose of trying to increase productivity at any cost, increase production at any cost?

Mr. **Redmon**. I don't know if "at any cost," but I think there has been a definite change to reduction from strictly the economical and also the environmental issues, as far as reducing the amounts put out there.

Senator **Kerrey**. I am asked, far more often than I want to be, what were the lessons of Vietnam? So let me ask you, what were the lessons of the 1980's? You guys had to have a ball, living through PIK in 1983. What lessons did you extract from the 1980's?

Mr. **Early**. Let me, if I may, Senator Kerrey, take you all the way back to the late fifties, if I may, and bring you up through the things that have developed, and I won't take very long to do that, I promise you.

The chairman may remember when we grew a lot more cotton down through the Carolinas and Georgia than we do now, but back in the late fifties, the mid to late fifties, you know, we were applying pesticides to cotton every 5 days, whether you needed it or not, and we were putting on 30 and 40 pounds per acre during those days, and we were putting on chlorinated hydrocarbons, some pretty powerful materials.

We started in the late fifties with integrated pest management. We didn't call it that then. We called it scouts going out and looking at the bolls, looking for boll weevil damage, and then you began to recognize that you didn't need to put on all that amount, you didn't need to treat every 5 days whether you needed it or not, so management began to take place back in the late fifties with this new technology of pesticides and it has continued to grow ever since then.

Our companies were big supporters of integrated pest management when we first defined it back in the lateseventies, because it was ridiculous to try to go out and put products on that you didn't need. What you needed to do was to control the pest at an economic level that was acceptable to society and acceptable from an environmental standpoint, and that is exactly where we are now. Maybe we haven't educated, or pushed it along as far from the education standpoint as the chairman has advocated in his legislation, but it has been a gradual process here. It has been an evolution, Mr. Chairman. I would agree with that.

Senator FOWLER. I would call it segregated pest management. You had the black folks out there in the fields, and us white boys went by and found the boll weevil and snapped their heads off and dropped them in the Mason jar, and you got a penny a weevil.

Mr. EARLY. I remember that, yes.

Senator FOWLER. But that was segregated pest management.

Mr. EARLY. We used to mop cotton with things, too. You might remember that, also.

But I think there is a lot of technology that started a long ways back and is continuing to change, and as we look to the nineties, you know, we are going to start seeing some impact from biotechnology and some of the new innovations coming out of the laboratories, improved plants, you know, plant-resistant types of material. We are going to be moving genes around, some of the bright guys, smarter than me, out there.

It is not going to happen overnight, but at the turn of the century you are going to see some significant changes taking place in pest management in our society. I am not sure where it is going to be, but it is going to be different, I guarantee you.

Senator KERREY. Let me say, in closing, so you get an idea of where I sit on this thing, that I have the opinion that very often the people in the city are far more abusive of the environment than are the people on the farm. Nonetheless, we are talking right now about people in production agriculture.

Overall, one of the things that concerns me is making certain that people understand the need to save. In other words, if I have $1,000 worth of revenue, that is terrific, but unless I have something left over when it is all done, all I have really done is farm for somebody else. If I lose money for enough years, then I can go be a consultant, to teach somebody else how to lose money. [Laughter.]

To illustrate that, this committee had a banker at a previous hearing who was talking about the need for capital. Well, there is a need for capital in agriculture, so I posed to him this hypothetical question. I said, "I make $89,500 a year in the U.S. Senate, no outside income to speak of, so you tell me, Mr. Banker, what do I need to do over the next 10 years so that at the end of 10 years I have a $100,000 CD?"

There was no response. He really wasn't able to talk to me about saving money. He could tell me about borrowing and leveraging and interest rates and stuff like that, but he couldn't tell me how to save money. He is in the business now of lending, not of assisting people to save.

I appreciate that that may at times be counterproductive, but I hear in your answer an acknowledgement of a need to conserve the resource of capital in order to accumulate it. Is that correct?

Mr. **Early**. I think that's right. What I am really saying, as I said earlier on, I think what our industry can do is to maximize that yield and increase their profit. Also, with respect to saving money, you heard earlier over here, you were talking about what Mr. Redmon said: We have moved more toward banding of herbicides, for example. We don't just broadcast treat any more. Other issues, also we talked about postharvest treatments, where you don't buy the insurance, you take a little chance, and maybe you don't need the herbicide that year.

So a lot of things are going on right now in those areas that have changed in the last 4 or 5 years, in fact that is just changing now in that band treatment area, and encouraged by our members. In doing that, I think in some respects I guess we appear to be selling less material, but I think that's the way to go, because the farmer is not going to buy something if he doesn't get a $2 or $3 return on the investment. If he does, he is going to be stupid for doing it that way.

Senator **Kerrey**. You also know that things tend to be very competitive out in the field. I'm sure you have seen instances where a neighbor sees somebody else, for example, a plane comes over and starts spraying, and the next thing you know, he is spraying the next field and the next. The phones are ringing off the hook because there is a feeling that, "I had better do this thing right, because I don't want to have people drive by my field and see it full of weeds or whatever."

Mr. **Early**. I hope we are beginning to get away from that, and we are beginning to accept trash and that sort of thing in the fields now because of no-till and minimum-till farming. We hope that they are going to use more consultants and advisers to tell them when to use a product and when not to use a product.

Senator **Kerrey**. This is the kind of discussion that I think is extremely useful. I, as well, detected in both your testimonies some sort of reactive concern, without any pejorative on the "reactive"—a concern that we are going to come and hammer you with increased regulation.

I read a Pro Farmer survey a couple of weeks ago, that reported that 75 percent of Iowa farmers out there are saying, "We want to reduce herbicides and pesticides." That is what they are asking us. It is not me saying to them——

Mr. **Early**. But I don't think they are interested in reducing their yield significantly.

Senator **Kerrey**. That's right. They don't want to unilaterally disarm.

Mr. **Early**. Exactly right.

Senator **Fowler**. Well, now we are back to the war.

Mr. **Redmon**. Could I make one comment on the question, "What did you learn in the eighties?" One thing that we learned in our company, if we don't keep our customers profitable, we are not going to be there. That is why when we make recommendations on pesticides and fertilizers, we have to take that into consideration. Is he going to be able to pay for it? Is he going to make enough crop to pay for it? That's one thing I learned in the early eighties in this business. If my customer isn't profitable, I won't be there.

Mr. **Early**. And he won't be able to pay my members, either.

Senator KERREY. Let me run the risk of making the chairman angry with me here for putting one more thing in. One of the things I think that we have failed to acknowledge is that there has been a substantial change in the last two generations in the relationship between the person that grows the food and the person that eats it, a substantial change.

Two or three generations ago it was relatively common for a person to grow and at least eat part of what they had grown. We have gone through successive generations to a point now where consumers don't have any contact with the person growing or the person processing the food. I eat my food out of a bag. You know, it is prepared for me, so there is great anxiety about how it was grown and processed.

One of the things you said was, we should respond according to scientific data, not to emotion. I think that is impossible. Those of us who depend—as I do, being a Nebraskan—upon the profitability of farmers, have to understand that the consumer is always right.

If they conclude, as a result of watching television tonight, that green beans are fatal, and stop eating green beans, then consumers have reached the conclusion on their own, and it is going to be impossible for you all to come to us and say, "Well, you have to go out and educate the public." I have to educate the public, but not on that issue.

Today we are selling to a consumer that has a different relationship to the food than what consumers had 24 years ago, and there is greater anxiety, I think, as a consequence of that dependency. We have become more specialized and maybe more profitable as a consequence, but there is greater anxiety amongst consumers.

In my world, my retail world, I always begin by assuming the customer is always right. If they conclude that the product I serve them is garbage, it by definition has become garbage, and it is my job then to try to figure out what I can do to get them to buy it again.

Senator FOWLER. We thank you all for your participation. Thus endeth the lesson.

[Whereupon, at 3:10 p.m., the subcommittee recessed, to reconvene at 9:30 a.m., Thursday, March 1, 1990, in room SR-332, Russell Senate Office Building.]

[Material submitted for inclusion in the record follows:]

APPENDIX

PREPARED STATEMENT OF DEVORAH LANNER, CENTER FOR RURAL AFFAIRS, WALTHILL, NE

Mr. Chairman, thank you for this opportunity to provide written testimony on conservation policy issues of importance to the 1990 farm bill discussions. The Center for Rural Affairs is an unaffiliated, nonprofit, nonmembership organization founded in 1973 and located in Walthill, Nebraska. The Center is governed by a 17-member board of directors, consisting of half Nebraska farmers and ranchers and half rural Nebraska business people, attorneys, clergy and educators. Since its inception, the Center has been a part of policy debates affecting moderate-size family farms including sustainable agriculture, tax and credit policy, land-grant university research and access to land policies.

My testimony shall emphasize policy options that would advance the Food Security Act of 1985 conservation provisions—the Conservation Reserve Program, conservation compliance, and sodbuster provisions in particular. The 1990 farm bill should reinforce and deepen the public commitment to wise stewardship of the Nation's soil resources. Indeed, the recently introduced Farm Conservation and Water Protection Act of 1989 (S. 970) contains a number of commendable provisions that would enhance both soil and wetlands conservation. In several instances, our recommendations parallel and reflect proposals in S. 970.

CONSERVATION RESERVE

The public deserves and expects a long-term return for dollars spent on the Conservation Reserve Program (CRP). The lessons of the 1950's Soil Bank should be applied to the CRP. Although the soil-conserving aspects of the Soil Bank proved to be ephemeral once the program ended, this pattern need not be repeated with the Conservation Reserve. Farsighted policies to maintain the most highly erodible CRP acreage in grass or tree cover should be shaped well before the contracts elapse. We outline here 1990 farm bill policy recommendations for expanding upon current implementation of the program; protecting CRP lands beyond the 10-year timeframe; and utilizing the CRP as a bridge for moving toward more sustainable farming systems.

1. Permanent Easements.—Of primary importance are 1990 farm bill measures to prevent a second generation plowout on CRP lands following the 10-year period. We advocate the selective acquisition of permanent conservation easements on CRP parcels as the most cost-effective, long-range strategy for protecting such land from future abuse. Under an easement program, the Federal Government would purchase cropping rights from the landowner and would forever prohibit cultivation of the CRP acreage. Environmentally sustainable land uses which might include grazing, haying, recreation, maintenance of wildlife habitat, firewood harvesting and commercial timbering would be permissible under the terms of an easement. Permanent buy-out of cropping rights would be best (and more cheaply) targeted to the most erodible CRP fields wholly unsuited for cultivation belonging predominantly in land capability classes VI–VIII. (This is only one possible targeting mechanism to retire permanently the most marginal acreage—alternative approaches might utilize factors from the Universal Soil Loss Equation and the Wind Erosion Equation in developing targeting criteria.)

The price tag for securing easements on CRP parcels has not been fully calculated though research indicates that cropping rights on eligible Corn Belt cropland could average about $550 per acre (University of Missouri, Department of Agricultural Economics). These estimates are consistent with easement purchases in Minnesota's RIM program, which in 1987 averaged about $580 per acre. In the Great Plains, the per acre cost of purchasing easements would certainly be much less due to the poorer quality of the land. In any case, an easement program carefully targeted to the worst CRP lands (classes VI–VIII, for example) would likely be at a lower per acre cost than the figures cited above. Additional research is needed to more precisely peg the cost of a permanent easements program confined to a well-delineated category of CRP acres. We urge this subcommittee to seek such cost estimates from the Congressional Budget Office to better determine the budget implications of easement purchases.

We recommend that steps be taken to reduce the up-front cost of easements. For instance, the Secretary of Agriculture could be authorized to amortize easement purchases over a number of years—as many as 30 years at prevailing interest rates on Government bonds.

S. 970 would allow haying or grazing on CRP acres in the last 3 years of the contract if the producer agreed to a permanent easement or retirement of cropland base and allotment history represented by the parcel. We wholeheartedly support the easement concept, but believe that this provision would be strengthened if it were directed to the poorest CRP lands. This would place a lid on the cost of the program and make it more effective in achieving long-term erosion control. We are less enthusiastic regarding the base retirement option and view easements as a far preferable approach to buying long-term soil conservation benefits. Because of the tenuous nature of farm programs, permanent base retirement as a conservation tool only has value when farm programs attract a high level of participation.

We also stress that if the CRP is enlarged or extended under the 1990 farm bill, future CRP contracts on highly erodible acreage should come under the terms of a permanent easement. The rental payments could still be made over a period of 10 years or more but would amount to a permanent buy-out of the cropping rights. Permanent easements provide a long-term solution, often for not much more money than 10-year contracts that frequently provide little in the long run for a relatively high taxpayer investment.

2. CRP Expansion.—The *purposes* of the CRP should be expanded very selectively, to include environmentally sensitive cropped lands where land retirement seems to be the best solution. Such situations might include areas around sinkholes, certain critical ground water recharge areas, filter strips (allowed in the CRP now), shelterbelts that serve as wildlife habitat and field windbreaks (more on this below). We do not advocate increasing the CRP acreage size above the present goal of 45 million acres—as it is, it may be difficult to attain that goal by 1990. The pitfall is that a substantially enlarged CRP may become "all things to all people" and wind up accomplishing no environmental objective very well. We believe that efforts are best focused on finding ways to enroll the several million acres of highly erodible cropland that have thus far stayed out of the program. After all, the overriding purpose of the CRP is soil erosion abatement and we're some distance yet from seeing this goal realized as envisioned in the 1985 legislation. Also, land retirement is not necessarily the most appropriate or effective approach for addressing environmental problems such as ground water pollution.

3. Sodbuster to CRP.—The sodbuster rule does not apply to Conservation Reserve acreage; due to a loophole in the FSA and problems in USDA implementation. (CRP land had to be cropped for at least 2 years between 1981–1985; sodbuster applies to land that was uncultivated over this period.) However, the majority of CRP acres are subject to conservation compliance if returned to crop production. Unfortunately, the compliance standards are presently so weak that CRP land could hypothetically be farmed at erosion rates far exceeding the soil loss tolerance (T) standard. It makes no sense to have policies on the books that permit CRP lands to be farmed at anything less than the highest standards of conservation—the public investment in protecting and restoring this acreage has been substantial. This situation should be corrected by amending the FSA in the 1990 farm bill to apply sodbuster to highly erodible CRP acreage—both retroactively to parcels already enrolled and in future sign-ups.

4. Incentives for Tree Planting.—Special incentives are necessary to broaden interest in tree planting on CRP acreage, and should be strongly encouraged on the most marginal, erosion prone CRP fields. The Soil Bank experience demonstrated that trees are far more likely to remain in place than grass cover following the contract period. Every effort should be made to increase the level of tree planting. Establishment of trees on CRP parcels already seeded to grass should be cost shared and coupled with penalties for removing the trees (without replacing) at the end of the contract period.

Additional incentives beyond what are already offered for tree planting should be explored. Such incentives might include higher CRP rental payments, up-front lump sum payments, greater cost share assistance for planting trees and equipment rental, permanent easements or lengthening CRP contracts to 15 years. S. 970 takes a positive step to encourage tree establishment by offering farmers 15-year contracts for CRP hardwood plantings.

Furthermore, Congress should explicitly broaden the purposes of the CRP to include counteracting the "greenhouse effect." The CRP could have the potential for significantly reducing the United States' share of carbon dioxide emissions, according to research conducted by the Environmental Defense Fund (EDF). EDF's findings suggest that virtually all the carbon dioxide released by powerplants to be built in the next decade could be absorbed by 10 million acres of new forest and would be among the most cost effective options for reducing carbon dioxide in the atmosphere.

5. Shelterbelts, Field Windbreaks and Contoured Grass Strips.—We support language in S. 970 under which USDA would accept CRP contract offers for shelterbelts, field windbreaks, and contoured grass strips. These are important measures in curbing wind and water erosion and beneficial in reducing drought stress on crops, particularly if predictions of a global warming trend prove accurate. They are also valuable components in sustainable farming systems and the CRP could play a modest role in promoting adoption of such practices. Shelterbelts and field windbreaks decrease soil moisture loss and protect fields from the damaging effects of wind. Researchers have documented substantial net yield increases from adding tree windbreaks in fields, even after accounting for the land in trees lost to crop production. Contoured grass strips are highly successful in controlling water runoff and on some slopes can provide the erosion reduction equivalent of terraces, at a much lower cost.

1990 farm legislation should promote field windbreaks and shelterbelts for erosion control and as a drought protection measure. Establishment of contoured grass strips for the purpose of bringing land into compliance under an SCS approved farm conservation plan, excluding land in soil classes VI–VIII, should be made eligible for the CRP as proposed in S. 970. We recommend, however, that only the portion of the field covered by these practices be eligible, rather than the whole field. If removed at the end of 10 years (without replacing), the landowner should be required to pay back the 10-year payments, plus interest, as well as the cost share provided to establish the practice. Rotating the grass strips within the same field would not be considered removal, nor removal or replacement of windbreaks or shelterbelts due to age, disease or damage. In addition, harvesting of wood from shelterbelts and windbreaks would be allowed if it did not impair their value as windbreaks or shelterbelts.

Shelterbelts need not be restricted to trees. Although not widely in use, tall wheatgrass shelterbelts are a viable alternative to trees on the Great Plains and should also be made CRP-eligible. Currently, less than 10 percent of the Great Plains and Canadian Prairie is shelterbelt protected. Grass shelterbelts offer several advantages over tree shelterbelts in semiarid regions. They provide equal or better erosion control, require less capital investment, do not require supplemental irrigation, and can supply additional revenue if grass seed is harvested (Optimum Erosion Control At Least Cost, Proceedings of the National Symposium on Conservation Systems, December 1987). The CRP could encourage grass shelterbelt plantings as elements of sound conservation compliance plans on farms throughout the Great Plains region.

6. Research on Economic Uses for Highly Erodible Land.—Any successful national strategy for maintaining long-term protective cover on CRP acreage must include stepped up research efforts to identify and demonstrate economic alternatives to row cropping. For example, trees could be developed as energy crops in the form of firewood, raw products for wood gasification and fuel alcohol production, given a sufficient research investment. Some relevant research is already underway on incorporating grasses in farming systems. For instance, ongoing research on improving pasture productivity will enable farmers to fare better economically while keeping highly erodible land in protective grasses.

Although beyond the purview of this subcommittee, Congress should define the ultimate goals for its investment in agricultural research in the 1990 farm bill. Those goals should include development of profitable farming systems appropriate to moderate-sized, owner-operated farms which reduce soil erosion, decrease chemical use and protect water quality.

7. Disallow Cost Sharing on Land Unsuited for Cultivation.—To further discourage conversion of CRP lands to cropland, Federal conservation cost-sharing for production oriented practices should be eliminated for lands in capability classes VI–VIII. Even intensive conservation measures on these lands often cannot limit erosion rates to soil loss tolerance levels. Structural, capital intensive conservation measures should not be subsidized by the Federal Government on land that does not belong in cultivation. Limited cost share funds are best expended on less erodible and more productive cropland that is subject to the compliance provision. By the same token, cost share funds should not be frittered away on the very best land, when it would be more valuable on fields truly in need of treatment.

HIGHLY ERODIBLE LAND CONSERVATION—COMPLIANCE AND SODBUSTER

The 1990 farm bill should address implementation of the compliance provision. Since the law went into effect, the strength of the compliance provision has been steadily undermined by the specific rules and regulations, and administrative decisions of the Soil Conservation Service (SCS). Indeed, changes made in compliance requirements in spring 1988 to allow "alternative conservation systems," with no regard for soil erosion control standards threaten to defeat the 1985 act's soil conservation goals. No environmental assessment has been conducted to assess the impact of weakening compliance. Alternative conservation systems need evaluation for their emphasis (or lack of emphasis) on sustainable farming practices, and evaluated for their potential negative environmental impacts, such as increased ground and surface water contamination.

We urge that soil loss tolerance levels (T) be reinstated as a basic program objective for compliance and an upper limit be set on allowable soil erosion. Erosion above approximate soil replacement levels (T) should only be permitted where economic analysis reveals a legitimate hardship associated with meeting the basic standard. Standards should be developed for measuring and addressing undue economic hardship by considering factors that include eligibility for the CRP, farm size, the producer's income, and the producer's need to rely on farm income.

A significant problem surrounding compliance implementation is that commodity program rules frequently conflict with the compliance provision, by discouraging soil-conserving rotations. These conflicts should be eliminated, enabling producers to meet compliance requirements without losing base or farm program payments. S. 970 would significantly lessen this problem by allowing farmers to plant up to 40 percent of any crop base to resource conserving legumes or legume/small grain mixtures, without sacrificing base. Another factor hampering compliance rules is that Congress took no steps to provide farmers with financial assistance for implementing their conservation plans either through additional cost-share funding or loans to pay for structures and changes in farming practices. To address this problem, Agricultural Conservation Program (ACP) funding should be increased substantially and targeted to the most highly erodible land subject to compliance. In addition, low-income, moderate-size producers with a need to rely on farm income should be eligible for a higher rate of cost-share assistance in order to satisfy the compliance requirements.

We urge Congress to carefully examine progress in reducing soil erosion in light of the "alternative conservation system" policy. The 1990 farm bill should include language requiring an independent evaluation (non-USDA) of compliance as it approaches full implementation in the field. In cases where producers are farming at rates far exceeding soil loss tolerance levels under the alternative system plans, Congress should require that additional conservation measures be adopted to maintain farm program eligibility.

STRENGTHEN SWAMPBUSTER

We strongly support the provision in S. 970 that would amend the swampbuster rule by making drainage the violation, rather than planting a commodity crop on the drained wetland. Currently, a wetland can be converted with no penalty. Swampbusting only occurs, according to the law, when an annual crop is planted on the land.

EXTEND THE REACH OF COMPLIANCE, SODBUSTER AND SWAMPBUSTER

The cyclical nature of agriculture, including high and low price fluctuations and periodic land speculation emphasizes the need to extend compliance, sodbuster, and swampbuster to other areas where the Federal Government exerts influence. To discourage conversion of fragile land to crop production during boom periods, the conservation provisions should be strengthened by denying landowners certain tax benefits if they violate sodbuster, swampbuster, or fail to achieve compliance. This might include a requirement that violators use accrual rather than cash accounting and straightline rather than accelerated depreciation.

Likewise, these provisions should be strengthened in the 1990 farm bill by requiring federally guaranteed secondary market and Farm Credit System borrowers to implement an approved conservation plan on highly erodible land for which a loan is made—just as the Farmers Home Administration is required to do for its typically more modest-size borrowers. The provisions should also be applied to all users of below cost Federal reclamation water.

CONCLUSION

As the country looks toward a new farm bill, it is essential to preserve the gains represented by the conservation title of the 1985 Food Security Act, and build upon these measures. In addition, policies and rules that inhibit conservation and sustainable agriculture must be modified so that stewardship is no longer penalized, while practices that degrade land and water are rewarded.

A necessary step toward better land stewardship must be increased incentives and cost-sharing—because in many cases, the benefits conservation offers to society are greater than the apparent rewards to the individual landowner or farmer.

Future conservation measures should avoid being completely hitched to commodity programs. Currently, conservation compliance, sodbuster and swampbuster are only as strong as the incentive to participate in farm programs, and provide little or no protection for resources during periods of high market prices for major commodity crops.

PREPARATION FOR THE 1990 FARM BILL

Oversight on the Forestry Title of the 1990 Farm Bill

THURSDAY, MARCH 1, 1990

U.S. SENATE,
SUBCOMMITTEE ON CONSERVATION AND FORESTRY OF THE
COMMITTEE ON AGRICULTURE, NUTRITION, AND FORESTRY,
Washington, DC.

The subcommittee met, pursuant to notice, at 9:30 a.m., in room SR-332 and room SR-385, 2 p.m., Russell Senate Office Building, Hon. Wyche Fowler, Jr. (chairman of the subcommittee) presiding.

Present or submitting a statement: Senators Leahy, Fowler, Daschle, and Bond.

Also present: Senator Thurmond.

STATEMENT OF HON. WYCHE FOWLER, JR., A U.S. SENATOR FROM GEORGIA

Senator FOWLER. Good morning, everybody. I am Wyche Fowler, the chairman of the Subcommittee on Conservation and Forestry. We welcome all of you to this hearing this morning on private forestry resources.

The majority of this Nation's forest lands are in the hands of over 8 million private owners. The quality of these forests in the early decades in the next century is being decided right now. The importance of the outcome, I suppose, can hardly be overstated either from an economic or an environmental standpoint. We all know that the United States ranks first in the world in timber production, and I like to call us the OPEC of trees. I am proud to say that my home State of Georgia leads the Nation in many forestry products.

The forestry industry adds $62 billion a year to the value of the U.S. economy. In a time of enormous trade deficits it is one area in which we can anticipate expansion of our exports, but I guess I must add the caveat provided that we manage our timber resources wisely. Decisions are being made right now by thousands of private landowners across the country that will determine whether we retain that strong economic position. Extensive private forest holdings in this country also provide many other important benefits and address many other important needs of the country from clean air and water to fish and wildlife habitat. With so much at stake in our privately owned forests, we need the best technical assistance for long-term planning and management and the strongest research programs and stewardship initiatives.

Many States have already led the way in developing these kinds of programs, and I hope that we at the Federal level can devise ways to strengthen the partnership with the States and the Federal Government on forestry issues of such national importance. I would also suggest that we cannot afford to tarry in these efforts. The evidence coming in from many parts of our Nation already shows that harvests are exceeding growth; that many private landowners are deterred from replanting by their short-term economic outlook. It seems to me we have to reverse these trends now if we want to keep and expand our export markets, maintain a healthy industry for the future, and with the time that it takes for a forest to mature, avoid the consequences in the decades ahead of inaction today.

I expect many of my colleagues, but I try to start on time.

I am grateful for the administration for being here. Our leadoff panel will begin with Ms. Patricia M. Kearney, the Acting Assistant Secretary for Natural Resources and Environment of the Department of Agriculture. She is accompanied by Chief Robertson, whom everyone knows; Allen J. West, the Deputy Chief of State and Private Forestry; and Mr. Tony Dorrell, the Director of Cooperative Forestry. Ms. Kearney, we welcome you and thank you so much, you and your team, for being with us this morning as our leadoff witness.

STATEMENT OF PATRICIA M. KEARNEY, ACTING ASSISTANT SECRETARY, NATURAL RESOURCES AND ENVIRONMENT, U.S. DEPARTMENT OF AGRICULTURE, WASHINGTON, DC; ACCOMPANIED BY F. DALE ROBERTSON, CHIEF, U.S. FOREST SERVICE; ALLEN J. WEST, DEPUTY CHIEF, STATE AND PRIVATE FORESTRY; AND TONY DORRELL, DIRECTOR, COOPERATIVE FORESTRY

Ms. **Kearney**. Thank you very much, Mr. Chairman.

INTRODUCTION

I am delighted to be here to present the administration's views on State and private forestry issues as they relate to the 1990 farm bill and the President's new proposal, "America the Beautiful Campaign." I really appreciate this chance to discuss some of these issues with you.

THE BASIC THEMES OF THE ADMINISTRATION'S FARM BILL PROPOSALS

Just very briefly, as you know, the basic themes of the administration's farm bill proposals are increasing market orientation, improving international competitiveness, and addressing environmental concerns. Certainly this last item is what we will focus a lot more on today. It is certainly a very major priority for us at the Department of Agriculture.

Briefly, with this in mind, our farm bill proposal enhances the resource stewardship of American farmers through greater production flexibility, incentives to change resource use in environmentally sensitive areas, and also focuses on further research and technical assistance.

MOVING FORWARD WITH A NEW PERSPECTIVE TO ASSIST OUR NATION IN ACHIEVING ITS GOAL OF GOOD STEWARDSHIP OF THE LAND AND ITS RESOURCES

We at the Department are moving forward with a new perspective to assist our Nation in achieving its goal of good stewardship of the land and its resources. The Forest Service has a legal mandate for multiple-use management, and we are aggressively focusing the Forest Service program on the wise use of a broad array of resources. We are working hard to balance the ever-increasing societal needs and demands on our National Forest System. We have been and will continue to put more and more emphasis on the recreational needs and wildlife and fisheries resources, while being sure to retain stable levels of timber harvesting and livestock grazing.

In this historic period of heightened environmental awareness and concern we have a unique opportunity to increase the multiple-use context of State and Private Forestry's program of assistance for State and private forest lands. We will be doing a number of things in this program, and we will be happy to answer questions on this, but I want to emphasize that we are going to continue to work to expand our partnerships, the Federal Government working with State forestry organizations, private landowners, businesses and communities. And Dale Robertson will cover that in the Q&A more specifically if you would like.

RESEARCH

Research is also a very high priority and part of our long-term strategy for the Forest Service, and we will be emphasizing in the future a more interdisciplinary and integrated approach. The research program will emphasize: recreation, wildlife, fish, and water; timber management and utilization; forest inventory and economic analysis; and forest protection.

Managing multiple resources that are growing and changing and subject to increasing and competing demands is a complex and challenging task. Our research program and the financial and technical assistance that we provide through our State and Private Forestry program are ways of meeting this challenge. The State and Private Forestry program will also be an integral part of the Nation's new tree planting initiative announced by the President in this year's State of the Union Address.

"AMERICA THE BEAUTIFUL"

President Bush's proposal—"America the Beautiful"—will be the largest reforestation effort in the history of this country. It provides for tree planting and forest improvement on both rural and urban lands. The initiative calls for public and private sector cooperation with the goal of planting, improving, and maintaining 1 billion trees per year in communities and rural areas nationwide. Virtually every State, community, and individual will have the opportunity to participate. The program should produce multiple benefits for all citizens of this Nation and around the world.

Trees are a benefit to us all, and they enhance biodiversity, wildlife, air and water quality, recreational opportunities and improve landscape aesthetics and property values. They also help to reduce soil erosion and provide future supplies of timber and wood products. This initiative will strengthen the Nation in all of these areas for future generations.

THE REFORESTATION COMPONENT OF "AMERICA THE BEAUTIFUL" HAS TWO COMPLEMENTARY PARTS

The reforestation component of "America the Beautiful" has two complementary parts: the rural cost-share component, and a community trees component. The rural component provides for tree planting and forest improvement in rural areas through a 50/50 cost-share program and technical assistance program with private landowners. Much of the tree planting will take place on marginal and environmentally sensitive agricultural cropland and pastureland.

The community trees component will provide for a very aggressive community tree planting program that will rely heavily on corporate and citizen volunteer contributions for both labor and funding. National leadership for the volunteer effort will be directed toward increasing awareness and mobilizing individuals, businesses and organizations to support this planting effort.

"America the Beautiful" also calls for the establishment of a national nonprofit foundation to support and promote community tree planting across the country. This foundation will promote a nationwide volunteer effort, mobilize the corporate and community service sectors that I mentioned to donate funds and labor, and to plant trees in the nearly 40,000 cities, towns, and communities throughout this Nation. USDA—with our cooperators and existing networks—will assist States and communities to expand their infrastructure of technical expertise needed to coordinate this volunteer planting effort and will develop appropriate promotional and technical information to assist the volunteers. Legislation will soon be submitted to the Congress with respect to the proposed foundation. We have adequate authority to achieve all other aspects of the program except for the foundation component.

The President's budget proposes $175 million for the Tree Planting and Forest Improvement Program portions of "America the Beautiful" in fiscal year 1991; $65 million of that $175 million would be directed toward the community tree planting program, and $35 million of that $65 million would be slotted on a one-time basis as a grant for the private foundation. As I mentioned before, the rural portion of the program, $110 million, will provide funds for a 50/50 cost-share for tree planting and forest improvement with private landowners. The program also will provide funds to strengthen the technical assistance and infrastructure needed to work with landowners and assure that environmentally adapted planting stock is available so that the program will meet our needs.

THIS PROGRAM IS VERY EXCITING TO ALL OF US AT THE DEPARTMENT AND IN THE ADMINISTRATION

I think this program is very exciting to all of us at the Department and in the administration because it taps two major trends that we see emerging in a very strong way at the beginning of this decade. One is all citizens' concern for the environment and the second is this terrific energy at the local level of volunteers and citizens that want to participate individually or be a part of a major effort. And we feel that the "America the Beautiful" program can tap into both of the trends and excitement and be a huge success.

With that, I thank you again for the opportunity to be here, and I and my team stand ready to answer any questions you have.

Senator **Fowler**. Thank you very much, Ms. Kearney, for your fine presentation. We do, I am sure, have a lot of questions about this exciting new program, but we will wait just a minute before we go to the questions and answers.

[The prepared statements of Ms. Kearney and Mr. Robertson follow:]

STATEMENT OF
PATRICIA KEARNEY
ACTING ASSISTANT SECRETARY, NATURAL RESOURCES AND ENVIRONMENT
UNITED STATES DEPARTMENT OF AGRICULTURE

Before the
Subcommittee on Conservation and Forestry
Committee on Agriculture, Nutrition, and Forestry
United States Senate

Concerning State and Private Forestry Issues Related to the 1990 Farm Bill

March 1, 1990

MR. CHAIRMAN AND MEMBERS OF THE SUBCOMMITTEE:

I welcome the opportunity to appear before you today to offer the Administration's views on State and private forestry issues as they relate to the 1990 Farm Bill and the Administration's proposed "America the Beautiful Campaign." I am accompanied by Dale Robertson, Chief of the Forest Service, who will provide additional details in his testimony.

The basic themes of the Administration's Farm Bill proposal are increasing market orientation, improving international competitiveness, and addressing environmental concerns. Our proposal enhances the resource stewardship of American farmers through greater production flexibility, incentives to change resource use in environmentally sensitive areas, and further research and technical assistance.

As we enter the 1990's, there is increased public sensitivity to environmental quality and human health, the conservation and wise use of natural resources, and outdoor recreation opportunities. Charting a smooth course for meeting current and future resource needs will require increased and carefully integrated efforts of the public and government at all levels.

We at the U.S. Department of Agriculture are moving forward with a new perspective to assist our Nation in achieving its goal of good stewardship of the land and its resources. The Forest Service has a legal mandate for multiple-use management and will now be aggressively focusing its program on the and wise use of a broad array of resources. We are working hard to balance the ever-increasing societal needs and demands on our National Forest System . We are putting an increased emphasis on the recreation, wildlife and fisheries resources while retaining stable levels of timber harvesting and livestock grazing.

In this historic period of heightened environmental awareness and concern we have a unique opportunity to increase the multiple-use context of State and Private Forestry's program of assistance for state and private forest lands. This will be done through multiresource management planning consistent with landowners' objectives. Resource plans will be strengthened by expanding technical and financial assistance to landowners with wildlife, fisheries, water, and recreation resource development opportunities. We will continue to deliver the program by expanding partnerships with State forestry organizations, private landowners, businesses, and communities.

Research is also a very high priority and our long-term strategy for Forest Service research will emphasize a more interdisciplinary and integrated approach. The research program will emphasize: recreation, wildlife, fish, and water; timber management and utilization; forest inventory and economic analysis; and forest protection.

Forest protection research includes forest insect and disease research and forest fire and atmospheric science research. Research is expanded to develop safe and effective pest management strategies to reduce reliance on chemical pesticides, particularly for urban forests and forests used primarily for recreation. Forest fire and atmospheric science research accelerates its program to determine the effects of a changing atmospheric environment on the productivity, health, and diversity of forest ecosystems. The program provides information and technology needed to protect National Forest System investments and to support State and Private Forestry assistance to nonindustrial private landowners.

Managing multiple resources that are growing and changing and subject to increasing and competing demands is a complex and challenging task. Our research program and the financial and technical assistance that we provide through our State and Private Forestry program are ways we are meeting this challenge. The State and Private Forestry program will also be an integral part of the nation's new tree planting initiative, announced in this year's State of the Union address.

President Bush's proposal--"America the Beautiful"--will be the largest reforestation effort in the history of this country. It provides for tree planting and forest improvement on both rural and urban lands. The initiative calls for public and private sector cooperation with the goal of planting, improving, and maintaining one billion trees per year in communities and rural areas nationwide. Virtually every State, community, and individual will have the opportunity to participate. The effort will result in providing multiple benefits for all citizens of this nation and around the world.

"America the Beautiful" will help to demonstrate America's commitment to address worldwide concerns about deforestation and global climate change, by providing a positive example of action in the United States. The initiative will improve forest management and provide multiple environmental, social, and economic benefits. Trees enhance biodiversity, wildlife, air, and water quality, and recreational opportunities, and improve landscape aesthetics and property values. They help to reduce soil erosion and provide future supplies of timber and wood products. This initiative will strengthen the Nation for future generations.

The reforestation component of "America the Beautiful" has two complementary parts: the rural cost-share component, and a community trees component. The rural component provides for tree planting and forest improvement in rural areas through cost-sharing and technical assistance with private landowners. Much of the tree planting will take place on marginal and environmentally sensitive agricultural cropland and pastureland.

The community trees component will provide for an aggressive community tree planting program that relies heavily on corporate and civic voluntary contributions of both labor and funding to underwrite costs of tree planting and care in communities. National leadership for the volunteer effort will be directed to increase awareness; promote contributions of funds and in-kind resources; and mobilize individuals, businesses, and organizations to support the planting effort.

"America the Beautiful" also calls for the establishment of a national non-profit foundation to support and promote community tree planting across the country. This foundation will promote a nationwide volunteer effort, and mobilize the corporate and community-service sectors to donate funds and labor to plant trees in the nearly 40,000 cities, towns, and communities throughout the country. USDA--with our cooperators and networks--will assist States and communities to expand their infrastructure of technical expertise needed to coordinate volunteer tree planting efforts and develop appropriate promotional and technical information to assist volunteers. Legislation will soon be submitted to the Congress with respect to the proposed foundation.

The President's budget proposes $175 million for the Tree Planting and Forest Improvement Program portions of "America the Beautiful" in fiscal year 1991. Sixty-five million will be directed toward a community tree planting program that involves corporate and civic voluntary efforts. Thirty-five million dollars from this sixty-five million will be directed as a one-time grant to the private foundation. The rural portion of the program ($110 million) will provide funds for a 50/50 cost-share for tree planting and forest improvement with private landowners. It also provides funds to strengthen the technical assistance and infrastructure needed to work with landowners and assure that environmentally-adapted planting stock is available.

The Forest Service and the Soil Conservation Service are leaders in conserving and wisely using the Nation's forests and rangelands. These agencies work closely with State forestry and conservation organizations to help private landowners, businesses, and communities apply good forestry and conservation practices on their lands. Our current authorities are adequate, our multiple-use management philosophy works well, and we have the trained professionals to help the President implement this exciting new initiative.

Chief Robertson is prepared to give you more details about the State and Private program and the role of the Forest Service in support of the Administration's 1990 Farm Bill proposal.

I will be pleased to answer your questions.

STATEMENT OF
F. DALE ROBERTSON, CHIEF
FOREST SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

Before the
Subcommittee on Conservation and Forestry
Committee on Agriculture, Nutrition, and Forestry
United States Senate

Concerning State and Private Forestry Issues Related to the 1990 Farm Bill

March 1, 1990

MR. CHAIRMAN AND MEMBERS OF THE SUBCOMMITTEE:

Thank you for the opportunity to provide the Subcommittee with more details on the Forest Service's role in implementing the President's tree planting initiative and the Administration's 1990 Farm Bill proposal.

Under the Cooperative Forestry Assistance Act of 1978, our State and Private Forestry (S&PF) programs provide technical and financial assistance to State forestry organizations that, in turn, assist private land owners. The 1978 Act has proven to be an excellent piece of legislation, and it contains sufficient authorities to carry out our cooperative approach to private forest land management working through the State Foresters.

Our S&PF programs reach across ownership boundaries to promote the wise use of our natural resources today and to plan for continued wise use by future generations. S&PF also serves as the Forest Service link to the rest of the Department of Agriculture in the delivery of agriculture conservation programs that include forestry activities on private lands.

I would like to briefly summarize the major elements of our S&PF program.

First, forested lands must be protected from wildfires, insects, and diseases. Since these problems know no boundaries, they must be dealt with regardless of ownership. Our forest pest management program helps land managers protect forest resources from insects and diseases on all forested lands--Federal, State, and private. We also provide training, information, technical expertise, and equipment in support of rural fire prevention and control and rural community fire protection.

Our cooperative forest management program provides technical and financial assistance to State forestry organizations that, in turn, provide technical advice to private landowners. The Forestry Incentives Program (FIP) and the forestry portion of the Agricultural Conservation Program (ACP) provide financial incentives to owners of nonindustrial lands for reforestation and timber stand improvement. FIP and ACP account for much of the reforestation on nonindustrial private forest lands and thus are important in meeting the Nation's wood supply needs.

The urban and community forestry program promotes improvements in community quality of life through the planting and management of trees, shrubs, and other vegetation. These efforts improve the environment and make major contributions to soil, water, and air quality. Public recognition of the value of urban trees and forests continues to increase.

In support of expanding tree planting assistance, we cooperate with the States in upgrading the quality of nursery tree seedlings. This results in increasing seedling survival, shortening rotations, improving resistance to insects and disease, and improving tree form and wood quality.

As a result of years of experience with State and Private Forestry programs, we believe we are in a very good position to provide support to the President's tree planting initiative as part of the "America the Beautiful" campaign. The President's 1991 Budget includes $175 million for tree planting and forestry improvement. The proposal has both rural and urban components.

A budget of $110 million is proposed to provide a pool of cost-share dollars and to strengthen technical assistance for tree planting and forest improvement in rural areas. A budget of $65 million is requested to promote and support a nationwide volunteer effort--mobilizing the corporate and civic sectors to donate funds and labor--to plant of 30 million trees annually in the nearly 40,000 cities, towns and communities throughout the country.

The Forest Service will provide professional forestry leadership and build upon the existing technical assistance delivery system, working through State Foresters and other cooperators. We will also assist States and communities to develop, strengthen, and expand the infrastructure of technical expertise necessary to coordinate, train, and promote this volunteer effort.

The Administration's 1990 Farm Bill proposal recommends that the current 40 million acre Conservation Reserve Program be extended through 1995. Eligible acres will be targeted to achieve environmental objectives such as windbreaks, shelterbelts, and filter strips. Our S&PF programs and our network of cooperating State Foresters will provide essential support to the Administration's Farm Bill proposal.

In summary, the President's tree planting initiative offers an exciting opportunity for this country to plant millions of trees and improve forest management in both rural and urban areas that will provide many important environmental and economic benefits for years to come. The Forest Service is well prepared and anxious to be a partner in this effort.

I will be pleased to answer your questions.

Senator **Fowler**. We have been joined by the distinguished senior Senator from South Carolina, Senator Thurmond, and we are delighted to have him as a witness. That will up our image and ruin yours, Senator Thurmond. [Laughter.]

So we welcome you this morning, for your statement.

STATEMENT OF HON. STROM THURMOND, A U.S. SENATOR FROM SOUTH CAROLINA

Senator **Thurmond**. Thank you very much, Mr. Chairman. I appreciate your kind remarks. And as one whose ancestors went from Virginia to Georgia and then some of them over to South Carolina and some still remain in Georgia, we feel very close to Georgia people.

Senator **Fowler**. And the rich ones went to South Carolina.

Senator **Thurmond**. Well, they had a lot of intuition. [Laughter.]

Mr. Chairman, I would like to thank you really and the members of the Senate Agriculture Subcommittee on Conservation and Forestry for the opportunity to testify here today.

Mr. Chairman, I am sure you and the other committee members have heard of the devastation Hurricane Hugo caused to many thousands of acres of timberland while passing through South Carolina, North Carolina, Puerto Rico, and U.S. Virgin Islands. Here are some pictures provided by the South Carolina Forestry Commission. We will put them right up here where you can see them. They vividly show the massive destruction this storm caused.

The morning after Hurricane Hugo hit South Carolina, I was in the State examining firsthand the damage caused by this storm. The destruction I saw reminded me of a war zone. Hurricane Hugo caused damage unseen in modern history. Approximately 36 percent, or 4.4 million acres, of the 12.2 million acres of forested land in South Carolina were damaged. Of the 46 counties in my State, 23 suffered significant timber damage and 7 of those are classified as extensively damaged. Estimates are that Hugo damaged a total of 6.7 billion board feet of timber. Since South Carolina normally harvests only 2.2 billion board feet annually, it would take 3 years under normal conditions for loggers to cut this amount of timber.

Approximately 660,000 homes could be built with the volume of sawtimber damaged. This is more timber than was damaged by the eruption of Mount St. Helens, the Yellowstone fires of 1988, and Hurricanes Camille and Frederick combined. Mr. Chairman, while the forest industry is currently working overtime and bringing in logging crews from outside the region to help salvage timber, this is a short-term boom. The 30,000 South Carolinians employed in the forest industry will suffer for many years from this catastrophe.

It has been estimated by employment analysts that many localized forestry jobs, such as sawmilling, will vanish or relocate for several decades as the forests regenerate. In addition to the $1 billion direct loss to timber owners, another $10 billion in products and sales could rot in the woods.

Mr. Chairman, from these examples, you can see that this hurricane caused serious damage to our forest and natural resources. On October 5, 1989, along with Senators Helms, Hollings and Sanford, I introduced S. 1728, the Hugo Forestry Restoration Act, to provide assistance for landowners to replant their damaged forests. Specifically, this bill would authorize $100 million to aid the landowners in their reforestation efforts and be administered through the local Agricultural Stabilization and Conservation Service offices. This legislation is similar to the Forestry Incentive Program (FIP) which is currently in existence.

Mr. Chairman, under this bill, financial assistance would be provided on a cost-share basis between the Federal Government and the landowner. For persons owning less than 1,000 acres, assistance could be as much as 75 percent of the total cost of implementing eligible practices. For owners of more than 1,000 acres, cost-share could be as much as 50 percent of the total cost of the recommended practices.

Landowners who apply for assistance for site preparation and reforestation would have to complete a forest management plan in consultation with the State Forest Service. Currently, this practice is required for the FIP and helps assure that the forests are restored in a beneficial manner.

Mr. Chairman, much interest has been directed toward forest issues in the recent past. In its budget proposal for fiscal year 1991, President Bush has proposed a program called "America the Beautiful," which would increase tree planting efforts by 25 percent. The wife of Agriculture Secretary Clayton Yeutter, Mrs. Jean Yeutter, became the first volunteer in the "Treemendous America" program sponsored by U.S. Forest Service to help support tree planting and reforestation efforts across the United States.

Additionally, environmental groups are stressing the importance of planting more trees to help restore and maintain our atmosphere. With this emphasis on reforestation, we must set priorities to help those areas where reforestation is most needed such as areas hit by Hurricane Hugo. Natural disasters are beyond the control of people affected, and assistance should be readily available to them. The Federal Government has provided help in rebuilding roads, small businesses and housing assistance to individuals due to natural disasters.

These items are usually insurable for loss unlike our forests. Trees are just as important as these items in maintaining and enjoying our lifestyle.

Mr. Chairman, I appreciate the opportunity to testify before this subcommittee this morning, and I hope this testimony will be beneficial to you and to the other committee members in your efforts to formulate forest legislation. I appreciate the able Senator from Missouri being here, too. He is an outstanding Senator here, and very broad-minded like the chairman, and I am sure you all will approve this bill. I thank you very much.

Senator FOWLER. I hope you will add me as an original cosponsor, Senator Thurmond.

Senator THURMOND. That is mighty nice. I do appreciate that.

Senator FOWLER. I would be very pleased to join you and the others.

Senator THURMOND. I will certainly do that. Thank you very much.

Senator **Fowler**. I have also toured the area in South Carolina, the disaster, and you speak accurately, unfortunately, about the level of devastation, and I think we ought to do everything we can to help.

Senator **Thurmond**. Well, that is mighty nice of you and I appreciate it. And if Senator Bond would like to join, I would be glad to add his name, too.

Senator **Bond**. Please add me.

Senator **Thurmond**. I thank you very much. Two able distinguished gentlemen, thank you so much.

Senator **Fowler**. Thank you very much, Senator Thurmond.

Senator Bond.

STATEMENT OF HON. CHRISTOPHER S. "KIT" BOND, A U.S. SENATOR FROM MISSOURI

Senator **Bond**. Thank you very much, Mr. Chairman.

We are very much concerned by the devastation in North and South Carolina, and it is a pleasure to join with you, and the distinguished Senators from that State, in an effort which in part would be, I am sure, part of the President's broader objective but one particularly targeted to an area which has suffered an unprecedented loss.

Mr. Chairman, this morning's hearing does come at a very exciting time for U.S. forestry and for several reasons, not the least of which certainly is the President's commitment to the environment, the great interest of the Secretary of Agriculture, reflected by the involvement of his very able wife in this program. And I think the public itself has a renewed interest in forestry programs. The America the Beautiful program which will use $175 million for tree planting and forestry improvement is a commendable start.

I apologize to you and to the other witnesses that I am not going to be able to stay for the full hearing this morning because we have been working on forestry from the other side, trying to craft a compromise on acid rain which will stop the acid precipitation attack on trees and I feel we are very close to success there. But we have a little more work to do.

Although Missouri has only one national forest, the Mark Twain National Forest, we are very much interested in forestry programs and issues. My home town of Mexico, Missouri has a very active tree planting program of which they are quite proud and I am quite proud. The State of Missouri has many such local efforts which I am sure will be delighted to participate in the program and will show real leadership. I, with my staff, and with USDA are currently working on a conservation title for the farm bill which will include several new tree planting initiatives which we hope will get a little further down the road toward the goal of 12⅛ percent of the CRP land. We regretfully are far behind the pace in Missouri right now, and we think we can do some things to improve it.

I might add for our friends from USDA that we are going to continue to push for a new U.S. Forest Service North Central Forest Experiment Station field laboratory at the University of Missouri. The lab will be a great benefit to the 14 States in the region. I am pleased to report that all of the private funds for the building have been secured. We are awaiting only the Federal component. I believe the Forest Service is supportive of the project and look forward to working with them as we work to secure the remaining funding.

Finally, I am very sorry that I am not going to be here, but I do want to say a warm word of welcome for a good friend and fellow Missourian, Dr. Al Vogt. Al is the director of the School of Natural Resources at the University of Missouri. He has been instrumental in implementing Missouri's forestry programs. We have also worked very closely with him on the project to which I just referred, and I think you will find him an extremely knowledgeable witness and one who is doing a very able job at the State level. Again, my apologies. We look forward to reviewing the materials presented by the witnesses, and I assure you that we are going to continue to work with you on these worthwhile objectives. Thank you, Mr. Chairman.

Senator FOWLER. Thank you, Senator Bond.

Ms. Kearney, we are all extraordinarily interested in the administration, the President's proposal, America the Beautiful. And you hit the highlights. I would like to discuss in as much detail as possible what has been put together. So to begin very simply for clarification, is the administration proposing to plant 1 billion trees a year or an additional 1 billion trees a year?

Ms. KEARNEY. It would be an additional 1 billion trees.

Senator FOWLER. How many acres does that anticipate? Do we have any kind of figure on that yet?

Ms. KEARNEY. It would be between 1 and 1½ million acres. I do not know if we have something more specific.

Mr. ROBERTSON. About 1½ million.

Senator FOWLER. 1½ million additional acres?

Mr. ROBERTSON. Yes.

Senator FOWLER. Great. And though I am not an expert on the Northeast—well, Southeast either as a matter of fact—how much of the program will be devoted to managing existing forest lands? Is that anticipated?

Mr. ROBERTSON. Yes, some of the cost sharing in the rural areas would be going to timber stand improvement and interplanting in existing forest lands.

Senator FOWLER. But they have not broken that down yet?

Mr. ROBERTSON. Well, that depends. We need to work with the landowners and work with them on a plan, and look at their situation which the State foresters or consultants will be doing. And depending on the needs, we will have a mix there by landowners by planting and any kind of interplanting or timber stand improvement.

Senator FOWLER. Well, Chief and Ms. Kearney, I guess that naturally leads to whatever we do, the forest practices under the program will of necessity vary somewhat from region to region, will it not?

Ms. KEARNEY. Yes, it will.

Senator FOWLER. For instance, if you plant a lot of trees on pastureland to get a good survival, there will be additional practices will be required, will they not?

Ms. **Kearney**. Yes, it would. It would vary definitely from region to region and it will depend upon the condition of the land and a number of factors. And that is where the assessments that are done would contribute to that. Dale, do you want to add anything?

Mr. **Robertson**. Mr. Chairman, we will use our regular delivery system working through the State foresters and working with private landowners, and part of this funding, $110 million for rural tree planting, would be technical assistance in developing these plans. So we do not intend to come up with a new delivery system in doing this job. We do plan to try to expand our partners and also expand the contributions by the private sector and local groups that would help primarily in the urban and community areas. But the rural part of this tree planting is pretty much following our existing delivery system and how we get that job done.

Senator **Fowler**. Well, I want to go into the delivery system, of course, in a minute, so I am glad you raise that. But I want to go back to the cost sharing for a minute. For instance, in Georgia, in my State, I would hope that part of the eligibility for the tree planting program would be on pastureland. And I would like for you to respond to that, of course, and if that is the case, then if marginal pastureland becomes eligible under the program, to get a good survival, will not additional forest practices be required including herbicides and pesticides, and if so, will that be part of the cost sharing program?

Ms. **Kearney**. Dale, do you want to respond?

Mr. **Robertson**. It could, but we have not thought that through in terms of followup after the tree planting. We do want to make sure we have a forest established and it is growing, and so we could use these funds according to a plan that was developed with the landowner not only to do the planting but any kind of stand improvement or work that has to be done to make sure that forest, those trees, survive and make it into a forest.

Senator **Fowler**. Well, the first question he is going to ask is I am going to have to have some soil treatments and herbicide treatments if we are going to get a good survival rate. And he is going to ask who is going to pay for it. So I would appreciate as your—I know everything could not be in place at this moment, but as soon as you can provide that information, we will be able to attract far more interest. Now on the delivery systems, you have already anticipated that, Chief Robertson. We have a capable network and delivery system for getting the seedlings in the proper place at the proper time.

My staff got this figure for me this morning. For 1990, the seedling and nursery program, under the Forest Service, was funded at $1.8 million. The administration's budget for fiscal year 1991 is proposing a decrease down to $1.73 million. So with all this new tree planting, where are we going to get the trees?

Mr. **Robertson**. Well, we will get them from the existing nurseries or expansion of those nurseries. And we have been under a major tree planting program with the CRP for the last 4 years, and so we have tremendous capability out there to grow seedlings in existing nurseries, and we would hope the private sector would expand as well to help produce these seedlings.

Senator **Fowler**. But with the additional 1 billion per year, additional 1 billion per year, under the present network and delivery system that you are going to rely on, what percentage of that 1 billion can the Service guarantee delivery of for next year, the first year of the program?

Mr. **Robertson**. You mean from Forest Service nurseries?

Senator **Fowler**. Yes.

Mr. **Robertson**. Well, Federal nurseries only produce about 5 percent of the seedlings produced in this country, but the big producers are, first, the industry; they produce about 48 percent, and we would hope that they could expand and meet a big part of the need, and the No. 2 producer is the States, and they produce about 37 percent of the seedlings. So we would hope the traditional people who have been the big producers of seedlings would continue to expand and produce the seedlings needed to handle this planting program.

Now we only produce 5 percent, but we will expand those nurseries to our maximum extent that is practical to do our share, but we had not planned on developing new nurseries for the Federal Government.

Senator **Fowler**. Now Ms. Kearney, is the administration asking for-new legislative authority to implement the America the Beautiful program or are we using existing programs?

Ms. **Kearney**. For most of America the Beautiful, we have existing authority. The only component that would need new legislation would be to establish the foundation. Everything else can take——

Senator **Fowler**. And as I think you said, that is a one-shot?

Ms. **Kearney**. That would be a one time grant.

Senator **Fowler**. $35 million?

Ms. **Kearney**. Right.

Senator **Fowler**. Well, as I say, I am very excited about the program, but I think the numbers do not quite add up yet. For instance, the administration is proposing significant cuts in the State and the Private Forestry program for 1991. And according to these figures, the two areas hit hardest are the pest and fire protection programs. It is hard to see how this would be consistent with a policy of increased tree planting and emphasis on healthier tree acreage. How would the administration suggest that we protect this new Federal investment of tree planting from fire and pest programs in light of the cuts? Neither of these problems are going to be limited by the private property lines. And they impact both public and private lands.

Mr. **Robertson**. Well, I think you make a good point, Mr. Chairman, but——

Senator **Fowler**. I am not trying to make any point. I am just trying to figure out how it fits. One thing we cannot do is let the rhetoric outrun the reality. If we tell people we are going to plant 1 billion additional trees and protect them, the resource has to be there including the private and the public money, the programs that will nurture the trees and make sure we do not lose them, and what I guess is the insurance policies which would include the pest and fire protection programs. So I am very interested in how we do that.

Mr. ROBERTSON. Well, this budget is consistent with the ones we have presented in previous years of trying to shift the fire protection and insect disease control work on private land to the private sector or the private landowners and the States. So this budget continues that basic principle.

Senator FOWLER. Congress appropriated nearly $6 million last year for a stewardship program in response to the hard work of the National Association of State Foresters who used the program in Alabama—I think it is called the TREASURE Forest—it is an Alabama program. Is that what it is called?

Mr. ROBERTSON. TREASURE Forest.

Senator FOWLER. TREASURE Forest program. You know, to be a working example of forest stewardship. The goal there was to place 25 million acres of nonindustrial privately held forest land under stewardship management nationwide over the next 5 years. The money for fiscal year 1990 was provided to the States for them to assemble a multiagency stewardship committee to coordinate the delivery of professional forest services to these landowners. Also each State is then required to design a stewardship plan to help meet the goals specific to each State. In the fiscal year 1991 budget there is no recognition of this plan. Is this program going to be incorporated into the America the Beautiful Campaign?

Mr. ROBERTSON. Mr. Chairman——

Senator FOWLER. I think you will probably agree, it seems—well, maybe not—but it seems to me inconsistent to suddenly drop this program now that each State is nearing completion of their stewardship plans.

Mr. ROBERTSON. There will be some overlap between the stewardship program and the technical assistance under tree planting. There will be funding in the tree planting program to provide technical assistance for people to go out and work with the landowner to develop a plan. And of course, when we develop a plan, we just do not develop a tree planting plan. It is looking at the forests and what the needs and what the landowner's objectives are. So it would be my hope that we could combine Federal dollars on technical assistance on tree planting, which would involve developing these plans with State dollars and round those plans out so that they meet what we call a stewardship plan. But there is, due to the tree planting program, significant increase in technical assistance going to the States to help develop those plans.

Senator FOWLER. Which will be continued, and which may or may not be within the America the Beautiful program?

Mr. ROBERTSON. There is funding in the America the Beautiful to do——

Senator FOWLER. For that?

Mr. ROBERTSON. To do the planning for tree planting. And of course, as I mentioned, you just do not go to a landowner and say, "Where do you want to plant trees?" You talk to them about what their objectives are. You look at what their situation is on their private land, and you develop a plan. And I would hope that with the combination of this technical assistance for tree planting and State funds, which already goes into this, that we could develop, continue to develop these stewardship plans that everyone is so excited about, and it is the way we need to go.

Senator **Fowler**. What agencies at the Department of Agriculture are actually going to handle the America the Beautiful program?

Ms. **Kearney**. The Forest Service has the lead in the Department of Agriculture for America the Beautiful, and they will work very closely with ASCS and to some degree the Soil Conservation Service as well.

Senator **Fowler**. I think I am going to take about 10 minutes here and do something unusual. Any of our panel members, first of all, that are going to testify here in a few minutes, we have about six—I do not know that it has ever been done before, but it will be fun to do. Do any of you have any specific questions about the America the Beautiful program for the administration here? Anybody else in the audience? Well, we have a failed town meeting. Stand up and state your name for the record.

Mr. **Fischer**. I am Monte Fischer, one of the panel members from the National Wildlife Federation.

Senator **Fowler**. Yes, sir.

Mr. **Fischer**. It is a wonderful opportunity, and when you said town meeting, being from New England, I could not resist the opportunity to stand up.

Senator **Fowler**. All right. This is your chance to ask a question. No speeches. Just ask the question.

Mr. **Fischer**. No. The question that I would have would be just on some of the details with the landowners, I think the track that you were on, Mr. Chairman, in terms of asking to pursue how you are going to work with landowners. Will there be some additional contractual arrangements? Will there be some assurances that landowners will carry out now that the tree program would be in place, the additional trees? How do we assure that this will be carried out especially in the light that there may not be additional funds to carry out some of the periphery components that are associated with the program?

Mr. **Robertson**. I will ask Tony Derrell to respond to that.

Mr. **Dorrell**. The contract that we enter into with the landowners really only involves the main objective of getting the trees planted and to a survival stage. But the other objectives that we have are carried out through the plan that Chief Robertson mentioned, and that plan does deal with wildlife, soil and water, and other sorts of benefits that we want to get out of the tree planting program. So we count on the contract to take care of the legal requirements of the cost sharing and the plan to take care of the multiple-use requirements.

Senator **Fowler**. Well, let me ask you this. Again, we are little bit in the family here and in the agency. Do you foresee, do you anticipate this in ~~its~~ plan now as more of a cost-sharing program similar to the Conservation Reserve Program or say the Forestry Incentive Program?

Mr. **Robertson**. It would be closer to the Forest Incentive Program. In other words, it is a cost sharing, but it would differ from the Conservation Reserve in that we are looking at all land, not just marginal cropland that has a high erosion rate. But we are looking at all lands, forest lands, pastureland, agricultural land, and land you might just say is out there not being used for anything. So it is a much broader base in which we are working under. It would be a one-time cost-share with whatever followup we have to do to make sure the trees survive and make it into a forest, but would not include the annual rental payments that is under the Conservation Reserve Program.

Senator **Fowler**. Do you anticipate that some of the money will go for replanting, to pay to replant timberland that the timber owner would be replanting anyway?

Mr. **Robertson**. No, I do not envision much of that.

Senator **Fowler**. If you are looking at all lands and not just marginal and environmentally sensitive lands, and I understand that, how are you going to be able to make that distinction, especially with this massive private effort in participation in money and money that is going to be needed to meet the Federal share?

Mr. **Robertson**. I will ask Tony Dorrell to respond to that.

Mr. **Dorrell**. Mr. Chairman, that question about whether the Federal money gets substituted for the private money comes up often. And while we do not have any studies that really pin down an answer, it appears in working out there with the landowners and the foresters who administer these programs, that usually what those landowners do instead of substituting money, they plant more acres with their money. So the net effect of the 50/50 cost-sharing approach is to double what they would plant were they going to plant on their own. So most of our analysis shows that there is not a great amount of substitution that takes place, that there is more of a tendency to induce additional planting in the private sector.

Senator **Fowler**. I welcome Senator Daschle.

I was delighted with the President's initiative personally and in my professional capacity, I guess we eagerly await the details of the implementation. The money is clear. I mean your request is clear. If the program is to be successful, certainly it seems to me it must have, and ought to have, the enthusiastic participation of the private sector. But I think that under the administration's proposed budget cuts and all of the programs that I mentioned specifically we have to, somehow those, that has to be reconciled. If the private industry and private landowners are asked to pick up those costs, if that is going to be part of their cost-sharing program, somehow there has got to be an initiative in there that will attract their enthusiastic participation, and I honestly do not see that initiative at this moment. We have to come up with the minimal, it seems to me, programs arranging from stewardship to the fire and pest prevention if we are going to convince the private sector to walk arm and arm with us.

And as the Chief said, that is where all the trees are. And that is where we want them grown and if we want to get an extra billion, we must have a lot of enthusiastic participation. So I will work with you as I have already told the Chief and Ms. Kearney, in your capacity. I look forward to it, but I think we have to move fast if we want to do what the President suggests, and we have to find a way, we have to get a lot more details on how it is going to work.

Mr. **Robertson**. I would like to just respond with a couple of comments. I do not think there is any question we need to do the job in fire protection and insect disease protection. It does get down to the issue of who pays for it and how do you fit the Federal, State and private money to pay for it. And the second point is that we want to work with the State foresters and other people at the State level and eventually at the local level, and we want some flexibility here to help design this tree planting program by States, working with the States so that people are involved. And it is not only the State but eventually local communities, so——

Senator **Fowler**. Well, the private foresters have done the work in the States that you asked them to. My understanding in almost every State their plan, their stewardship plan is ready.

Mr. **Robertson**. Yes.

Senator **Fowler**. And that is why I really want you to look at that. It seems to me that we really would be penny-wise and pound foolish if all of a sudden we scrapped that and reorganized the table of contents just to put a new name on the program. I do not mind putting a new name on the program, making it a national program, but I sure do want to tap the private expertise and the inevitable regional and statewide differences as you anticipated——

Mr. **Robertson**. Yes.

Senator **Fowler** [continuing]. That we have asked them to do and they have done it. So I hope we do not reinvent the wheel.

Mr. **Robertson**. No.

Ms. **Kearney**. Sir?

Senator **Fowler**. Please.

Ms. **Kearney**. I would like to just respond to that and say that we agree wholeheartedly with that sentiment, and we feel that this program will be developed so that it reinforces and strengthens these structures that are in place now, sees where we need to put more resources and reinforce them so that we get a stronger, better system. We do not intend to recreate the wheel in any way, but use what works and fortify that. So that will be the intent and a very strong objective as we develop these plans and specifics.

Senator **Fowler**. Thank you. Just one last comment to the Chief before I turn to Senator Daschle who has some questions. Chief, since we last met, I do, going from private lands to public lands for a minute, I do appreciate you following through what you said you were going to do in the reevaluation of the low-cost timber sale program. And I note with pleasure some of your initiatives. We will continue to work together on that and see if we cannot do a better job in the protection of the public's vast investment there. But I thank you for what you have done to date as a last result of our discussions.

Mr. **Robertson**. Thank you, Mr. Chairman.

Senator **Fowler**. Senator Daschle.

Senator **Daschle**. Thank you, Mr. Chairman. Let me just say how much many of us admire your leadership in this whole area. Without you and the kind of emphasis you have put on trees and Forest Service management, I think that we would have a lot further to go than we do. And I know I speak for a lot of members of this committee in expressing our real support for your efforts and especially for some of the comments you have just made.

I had two areas of concern, and I hope we can do them relatively briefly. Ms. Kearney, I would be interested in knowing whether the

America the Beautiful program has a coordinated plan for shelterbelts, and to what extent you will devote the America the Beautiful program to the creation of additional shelterbelts, and in relation to that, what kind of a plan specifically do you see for the Conservation Reserve Program as it relates to the America the Beautiful program?

Ms. **KEARNEY**. As far as specific details I will ask Dale Robertson or Tony Dorrell to give you the specifics. As far as the America the Beautiful and the Conservation Reserve Program, we see them being complementary in nature, but let me ask Chief Robertson or Tony Dorrell to give you more specifics.

Mr. **ROBERTSON**. The proposal for the farm bill is that we would extend the CRP from 34 million up to 40 million acres, and the proposal is that we would target that remaining 6 million acres on some high priority areas including wetlands and shelterbelts, wildlife habitat and water quality. And so there would be some part of the CRP that could apply to shelterbelts.

Now in addition, the America the Beautiful tree planting program is available for all tree planting on all lands, and we would hope that we would get a lot of shelterbelt, windbreak type plantings as part of America the Beautiful.

Senator **DASCHLE**. You are just kind of hoping that somebody comes up with it or are you are actually—my concern is that you are waiting for this to happen out there somewhere. I see Mr. West shaking his head. Maybe you would want to respond to that. It sounds like a pretty haphazard wish list out there. You wish that some of it will go into CRP. You are kind of wishing that some of it is going to happen in America the Beautiful without any kind of coordinated intensive effort to recruit planters of shelterbelts and others in this whole scheme of things.

Mr. **ROBERTSON**. Oh, there will be an aggressive——

Senator **DASCHLE**. Maybe I misunderstood your answer.

Mr. **ROBERTSON**. There will be an aggressive effort to recruit, try to get acres into the America the Beautiful. There will be a State committee in each State.

Senator **DASCHLE**. Do you have a goal in mind so you can measure your efforts against that goal in trying to determine your success?

Mr. **ROBERTSON**. Our goal is to plant 1 billion trees, and that is an ambitious goal, very ambitious, and we have to get trees everywhere in order to meet that. And in the Plains States, that is where a lot of those trees, I think, will go, and there will be the State forester and the other people in each of those States trying to figure out where we can get the trees planted working with the private landowners. So I would say, especially in the Plains States, that would be a major priority. And we would end up with trees in shelterbelts under both the Conservation Reserve Program, what is left of that, as well as the new tree planting program. It is high priority.

Senator **DASCHLE**. But you do not have any designated number of acres or miles of shelterbelt in mind at this point; is that right?

Mr. **ROBERTSON**. Not at this level.

Ms. **KEARNEY**. Not at this point.

Senator **Daschle**. Do you foresee having some sort of a goal in mind?

Mr. **Robertson**. We would like to work with the States, and we would like to see them set their goals with us encouraging that as one of the high priority areas to plant trees.

Senator **Daschle**. Well, as you say, it is an ambitious goal. And I hear a lot of—with all due respect—a tremendous amount of vagary about your plans to get this done. I would feel a lot more confident if I knew that you set as a goal so many miles of shelterbelt. This is exactly what the plan is going to be for encouraging participation in CRP. These are the things we are going to be doing, and this is the time length within which you are going to do them, and we'll give you a report as to how close we are to those goals in 6 months. What I hear is, well, by golly, this is going to be an important issue, and we are going to push it, and we are going to work with the States, but after you have been around this place for awhile, you hear a lot of these things, and those goals never really develop into concrete policies and proposals. So you have to forgive my skepticism to a certain extent, but I do hope you can give us a periodic report as to your progress here.

Frankly, I am very skeptical. Let me just turn to another question. I am an advocate of treebusters. I think it is a good concept. I think swampbuster and sodbuster have proved their value, even though not to the extent that I would like to see it in some cases. But I have heard one argument that gives me some pause about treebusters and that is that with the whole idea of a treebuster threat to further management of that land at some point in the future, people would be reluctant to enter into America the Beautiful or CRP or anything else for fear that they are going to get busted down the road if they were to do anything about that shelterbelt at some point in the future.

Have you heard anything like that as a concern? Would you care to comment as to the validity of a concern of that kind?

Ms. **Kearney**. I myself have not heard that concern at all. I think that is something we would have to look at. Dale, do you have a comment? Have you heard of that concern?

Mr. **Robertson**. No, I have not.

Mr. **Dorrell**. Well, it is a question, and I do not think anybody knows the answer. What we have experienced where we plant trees is that after a period of a time of about 10 years, usually those trees are of such a size and they are of so much importance to the people who own that land that they retain the trees. And in fact, the earlier Soil Bank plantings 20 years ago, we still have 90 percent of those trees in the ground and growing. So the general principle seems to be that people on their own will keep their trees.

And I think really that is sort of what brought us to the dance in the CRP 5 years ago, too, was that high retention rate for trees. So we get these legal requirements to run the period of a contract for the cost-share which is 10 years, and that usually sort of guarantees they are going to stay around.

Senator **Daschle**. Well, thank you all, and thank you, Mr. Chairman.

Senator **Fowler**. Ms. Kearney and all, thank you. I think we eagerly await a letter from you to reiterate—Mr. Daschle, I think I speak for them all. I see the chairman of the committee has arrived. Before I let you go, I better give Chairman Leahy a chance. But to reiterate what we both said that we need specific goals by which we can measure success. And we need specific recommendations as to how we are going to encourage the private sector to enthusiastically participate. Because I know in listening to this administration and the previous one, and I know you will agree, unless we have the enthusiastic participation of the private sector, the program cannot meet the goals or be the success that we all want it to be. So let us keep in touch.

Ms. KEARNEY. We will, and we appreciate that concern, and that is correct about the enthusiastic participation, and that will be a very major component of our plan to ensure that that happens. And we will go into agreements with cooperators that will agree to push this with their constituencies and groups.

Senator FOWLER. Thank you very much for your participation. I know you have other things, other fish to fry so I will let you go.

Ms. KEARNEY. Thank you.

Senator FOWLER. We welcome the chairman of the full committee, the distinguished Senator from Vermont, Patrick Leahy, for anything he wants to say or do.

STATEMENT OF HON. PATRICK J. LEAHY, A U.S. SENATOR FROM VERMONT

The CHAIRMAN. Thank you, Mr. Chairman. I just want to compliment you for having this hearing, and I will try to be very brief because I know you have a caucus to attend, among other things going on here. But I did want to thank you for convening and chairing this hearing, because what you recommend to the full committee will be important to all of us in crafting the forestry title of the farm bill.

I also wanted to thank the Ranking Member of the full committee, Senator Lugar, for his work on policies that make sense for our Nation's forests. In fact, we will soon introduce the President's plan to plant 1 billion trees a year for 10 years—a plan that will dovetail with our own farm bill initiatives.

Senator Fowler, as I said before, I will make sure I plant a couple of seedlings on my own tree farm in Vermont that you have been kind enough to visit on one of your forestry inspection tours.

Senator FOWLER. Unfunded inspection tour.

The CHAIRMAN. Unfunded inspection tour, but you graced our home and honored our State by being there, and so I was delighted to have you there.

I know Monte Fischer is in the audience and I want to welcome him. We go back to his days at the Vermont Natural Resources Council. Monte, I look forward to working with you in your new role at the National Wildlife Federation. Because I have to go the Subcommittee on Foreign Operations, I will not be able to stay through your testimony, but know that when we talk about forestry, I think of my own State. There, our forests are more than trees. They have given Vermont its character, in fact, its name. Vermont means "green mountains". We are going to have a framework for forestry in the 1990 farm bill.

And the forestry title comes at a time when our Nation's forests are really threatened. Our State and Private Forestry programs are just limited to controlling pests and putting out fires.

Today, the threats are far more severe. Our Nation's forests—both public and private—are beset by development and pollution such as acid rain. And I think one of the big problems has been that we have largely ignored the pleas of private forest owners who need our help. For example: in Maine, they have estimated that 23,000 acres of forest were subdivided into 580 lots between 1985 and 1988; air pollution is threatening to reduce growth and increase dieback in most of the Eastern States; Forest Service assistance to private forest owners was cut by 44 percent.

We have to remember our forests are not just the national forests—72 percent of the Nation's timberland is privately owned; 28 percent of these are farmers.

All those landowner's decisions are going to affect public forest land and vice versa. So we have to recognize that interdependence and work closely together.

We need a forest stewardship program as big and imaginative as the threats facing our forest.

This stewardship program should expand existing mandates so the Forest Service and the Department of Agriculture's responsibilities integrate public and private land ownership opportunities. We need forest land protection opportunities for resources with unique environmental and ecological resources; expansion of technical assistance programs from tree planting to other uses such as recreation, and fish and wildlife habitat; environmental education for landowners and our schools; and research to help answer the questions facing private landowners.

Mr. Chairman, I have a number of suggestions so I will submit my statement for the record because I know of your own time constraints. But my main purpose in being here was, well, really twofold, one, to again thank you for your efforts on forestry, but also to emphasize that with your help that forestry will be a major part and a major title of the farm bill this year as it comes out of the committee. We will remind everybody that the full title of this committee is Agriculture, Nutrition, and Forestry. Forestry will be heavily emphasized. Thank you, Mr. Chairman.

Senator FOWLER. Thank you, Mr. Chairman, very, very much.

[The prepared statement of Senator Leahy follows:]

PREPARED STATEMENT OF HON. PATRICK J. LEAHY, A U.S. SENATOR FROM VERMONT

Before I begin, I would like to thank Senator Fowler, who chairs this Conservation and Forestry Subcommittee, for convening this hearing. His insights will be instrumental in helping to craft the forestry title of the farm bill.

I would also like to recognize Senator Lugar. We have worked closely to develop policies that make sense for our Nation's forests. As part of that effort, Senator Lugar and I will soon introduce the President's plan to plant 1 billion trees a year for 10 years—a plan that will dovetail with my farm bill initiatives.

Finally, I would like to welcome Monte Fischer. Monte and I go back to his days at the Vermont Natural Resources Council. Monte, I look forward to working with you in your new role at the National Wildlife Federation. Unfortunately, I will have to leave before you testify because of a conflict with the Appropriations Subcommittee which I Chair.

Though I will not be able to attend this hearing let me assure those in this room that the development of a strong forestry title is one of my top priorities this year.

Vermont's forests are more than trees. They have given Vermont its character as well as its name. And I know that the same is true across the country, from Georgia to Indiana to Washington State.

For this, among other reasons, I will provide a framework for forestry in the 1990 farm bill. This legislation, which I will soon introduce, will be based on three key premises.

First, our Nation's forests are threatened as never before.

There was a time when managing our forests was limited to controlling pests and putting out fires.

Today, the threats are far more severe. Our Nation's forests—both public and private—are beset by development and pollution such as acid rain. To make matters worse, the Federal Government has largely ignored the pleas of private forest owners who need help in combating these threats. For example:

—In Maine, an estimated 23,000 acres of forests were subdivided into 580 lots between 1985 and 1988.

—Air pollution threatens to reduce growth and increase dieback in most Eastern States.

—Forest Service assistance to private forest owners was cut by 44 percent.

Second, our Nation's forests are not just the national forests.

Seventy-two percent of the Nation's timberland is privately owned. Twenty-eight percent of these are farmers.

The problems and opportunities facing our Nation's forests know no political boundaries or private property lines.

In Vermont, we are working toward managing both public and private forest land as a whole. We have learned several things from this experience.

We have learned that landowner decisions on their land affects public forest land, and vice versa. We have learned that our public and private forest lands are interdependent—environmentally and economically. We have learned that both public and private owners have different and legitimate ways they want to use their land and that a sensible forest management policy takes advantages of these differences.

Third, we need a forest stewardship program as big and imaginative as the threats facing our forests.

This stewardship program should expand existing mandates so that the Forest Service and the Department of Agriculture's responsibilities do not end at boundaries of each national forest.

Key elements of this stewardship program, which will be the heart of the forestry title include:

—Forest land protection opportunities for resources with unique environmental and ecological resources;

—Expansion of technical assistance programs from tree planting to other uses such as recreation, and fish and wildlife habitat;

—Environmental education for landowners and our schools; and

—Research to help answer the questions facing private landowners.

I apologize for leaving you now, but I look forward to working with members in preparing this title. I think we have a unique opportunity to bring Democrats and Republicans, environmentalists and commodity users together here. Our forests' future is at stake.

Senator FOWLER. Ladies and gentlemen, we have a problem I do not quite know how to deal with. So let me inquire. We have——

The CHAIRMAN. I will leave this to the chairman to work out.

Senator FOWLER. Not an emergency in the usual sense of the word, but the Senate has just recessed for an hour in order to have a conference of all the Senators, the Republicans in their conference of course, and the Democrats in their conference, on the Clean Air Act. We think we have an agreement reached by the group of 15 that have been doing all the negotiating including in the middle of the night an agreement on the acid rain, which was the last and most contentious. All the Senators will be there. I need to be there. But I just—it drives me crazy to inconvenience witnesses who have come. If all the panel participants, if they will stand and let me just ask you, who am I going to inconvenience completely if we recess now until, say, after lunch, till say 2 o'clock. I think we can finish them by an hour and a half then. But who am I going to lose definitely if we have to recess now?

Mr. GORDON. I have a previous engagement. I need to be leaving at about 1 or 1:30. Therefore, if it went longer, then I would probably have to just leave.

Senator FOWLER. Well, can I beg your—what is your name, sir?

Mr. GORDON. Robert Gordon on the last panel.

Senator FOWLER. Yes, I knew you were with Georgia-Pacific, Mr. Gordon. Well, I knew I would lose my Georgian if I lose anybody.

Mr. GORDON. We basically would have about a 5 minute presentation if time would allow if we substitute and mix up the schedule, we could do that. We would appreciate that.

Senator FOWLER. Well, let us put you on right now and give you that 5 minutes. To the rest, we have another problem. They tell me they need this room. I do not know. We have 2,000 rooms around here. I do not know why that is a problem, but staff, you know, likes to make problems sometimes. Might as well jump on them. They have a cotton hearing scheduled for this room. But I think what we are going to do is recess until 2 o'clock. I know it inconveniences everybody else, but I also know that most of you know how we have to operate around here and it is just very important that all of us be at this Clean Air conference and see if after 6 weeks now of work, we can get that handled.

Mr. Gordon, summarize your testimony, please. I know you will. The full prepared statement will be made part of the record, and I thank you.

STATEMENT OF ROBERT C. GORDON, GENERAL MANAGER, WOOD PRODUCTS EXPORTS, GEORGIA-PACIFIC CORPORATION, ATLANTA, GA

Mr. GORDON. I appreciate very much the opportunity to interrupt your schedule and hope we do not inconvenience you from your important duties.

Senator FOWLER. Excuse me, Mr. Gordon. Did anybody else—I am going to recess until 2 o'clock. So anybody who needs to go can go now, and we will come back here at 2. If we are in another room, we will be in another room. Thank you.

INTRODUCTION

Mr. GORDON. As stated, I am Bob Gordon from Atlanta, Georgia, and I am general manager of Georgia-Pacific's Export Wood Products Division.

I am here this morning to speak on behalf of the National Forest Products Association. Georgia-Pacific produces a vast variety of wood and wood processed products consumed by U.S. consumers as well as exported to nations throughout most regions of the world. I would like briefly to explain the industry's use of the Targeted Export Assistance Program, and then focus my attention on the export financing programs that are administered by the U.S. Department of Agriculture.

TEA

The Targeted Export Assistance (TEA) Program was created in the 1985 farm bill and was intended to provide economic relief to U.S. commodities aggrieved by foreign unfair trade practices, and this program has become one of U.S. agriculture's most effective weapons against unfair competition.

Unfair trade practices of foreign countries will continue to be a concern to our industry into 1990 and beyond. The wood products industry strongly supports the reauthorization of TEA programs at a full funding level of $325 million annually. We also believe Congress should resist legislating new guidelines for the program insomuch as the USDA has already introduced sufficient controls and any additional regulation would dramatically reduce the industry's flexibility to respond quickly to emerging market opportunities.

CCC EXPORT FINANCING PROGRAMS

In conjunction with the FAS marketing development program, the wood products industry has been successful in using the Commodity Credit Corporation's (CCC) GSM-102 export financing program for several years. The utilization of this credit program has helped open markets in foreign countries that would not normally purchase U.S. wood products. The GSM-102 program has been of great benefit to the wood products industry and we support its reauthorization. However, we believe that the funding cap of $5 billion should be raised to at least $7 billion to assure adequate resources for new market opportunities.

However, despite success in utilizing GSM-102, the industry has been limited to less than full credit terms available under the program, and has not had access to the full range of export financing available through the intermediate term credits under GSM-103, and with two recent exceptions, has not been approved for Public Law 480 title I program.

An increased demand for wood and wood products overseas has increased export sales dramatically, and a large potential exists through housing and shelter programs initiated in Latin America and other developing countries. However, to further these programs, the industry needs low interest credit and long-term credit guarantee programs, otherwise these markets developed by our industry will be lost to other countries that provide easy credit and other incentives.

ARGUMENTS FOR EXCLUSION

The USDA and the wood products industry believe there is an overwhelming precedent for classifying wood and processed wood products as an agricultural product eligible for the full range of USDA credit assistance. U.S. agricultural policy in the GATT has included forest products as an agricultural product. The GATT rules allow each nation to determine what products shall be classified as agricultural. Congress has also expressed its intent that wood products be classified as agricultural through statutory language in the 1988 Omnibus Trade Act.

The wood products industry believes it is important to understand that Public Law 480 is a developmental program for use in countries that are in need of the necessities of life. It is our contention that the necessities of life include not only food, but also clothing and shelter.

RECOMMENDATIONS

The wood products industry believes there is a need for Congress to further specify the language on the use of wood products under GSM-102, GSM-103, and Public Law 480 program.

Our industry would like to suggest the following steps that Congress may want to consider in order to help achieve full and fair access for wood products.

First, Congress should consider statutory language mandating the active use of all USDA concessional (Public Law 480) and credit guarantee (GSM 102/103) programs to promote the export of all semiprocessed and processed wood products as set forth in the harmonized system, chapter 44.

Second, additional statutory language should be considered to define wood and processed wood products as agricultural commodities, and as such, certify their access to the full range of export credit guarantees with the same terms and conditions available to all other agricultural products.

Third, Congress should help preclude further challenges to the use of export financing for wood products by providing the U.S. Department of Agriculture with a mandate and full authority to fully utilize the Export Credit Guarantee Program for wood products.

Fourth, Congress should clarify that providing wood products for shelter is both a humanitarian and export development activity fully eligible for funding under the Public Law 480 program.

CONCLUSION

The wood products industry is an internationally competitive, export-oriented industry committed to continuing growth of overseas market and certainly to help our balance of payment situation. The key to long-term development of additional export markets in less developed, developing and intermediate income countries is access to financing. Our industry believes that it is critical that the directives of Congress be followed and that wood and processed wood products be allowed—like any other agricultural product—to utilize these government sponsored financing programs to the fullest extent possible. We appreciate very much the opportunity to speak.

Senator FOWLER. Thank you, Mr. Gordon, for those four recommendations. That was very helpful, those four, the specifics.

Let me ask you just one quick question. I worked with the National Forest Products Association on several trade initiatives involving wood products. How would you describe, when you start to move on new markets in foreign countries, has the Department of Agriculture been helpful? How could we improve or how do you assess the help that you are now getting from the Department?

Mr. GORDON. USDA's Foreign Agricultural Service has been extremely helpful and cooperative in all of our efforts, and my experiences to date have been very gratifying. I believe, personally, that the promotion of these programs will benefit not only exports, but also we will be able to export the products that we produce for American standards. If you educate the other countries to utilize the products that we make normally, then we would not have to make a specific product for a specific end use.

Senator **Fowler**. Right. Right.

Mr. **Gordon**. It is an extension of those things which we currently use, and I think it helps develop that interest, knowledge about that, and will support industry very much.

Senator **Fowler**. Mr. Gordon, thank you very much.

[The prepared statement of Mr. Gordon follows:]

STATEMENT FOR THE RECORD

BY

ROBERT C. GORDON
GENERAL MANAGER, WOOD PRODUCTS EXPORTS
GEORGIA-PACIFIC CORPORATION

ON BEHALF OF

THE NATIONAL FOREST PRODUCTS ASSOCIATION

BEFORE THE

SUBCOMMITTEE ON CONSERVATION AND FORESTRY
COMMITTEE ON AGRICULTURE, NUTRITION AND FORESTRY

OF THE

UNITED STATES SENATE

MARCH 1, 1990
WASHINGTON, D.C.

GOOD MORNING AND THANK YOU FOR THE OPPORTUNITY TO TESTIFY TODAY. MY NAME IS BOB GORDON AND I AM GENERAL MANAGER OF WOOD PRODUCTS EXPORTS FOR THE GEORGIA-PACIFIC CORPORATION WHICH PRODUCES A VARIETY OF WOOD AND PROCESSED WOOD PRODUCTS FOR CONSUMPTION BY U.S. CONSUMERS AND FOR EXPORT TO NATIONS IN ALMOST EVERY REGION OF THE WORLD.

TODAY I AM TESTIFYING ON BEHALF OF THE NATIONAL FOREST PRODUCTS ASSOCIATION, A NATIONAL INDUSTRY TRADE ASSOCIATION REPRESENTING THE VAST MAJORITY OF THE NATION'S PRODUCTION AND SALE OF LUMBER AND WOOD PRODUCTS. I WOULD LIKE TO BRIEFLY EXPLAIN THE INDUSTRY'S USE OF TARGETED EXPORT ASSISTANCE AND THEN FOCUS MY COMMENTS ON THE EXPORT FINANCING PROGRAMS THAT ARE ADMINISTERED BY THE U.S. DEPARTMENT OF AGRICULTURE, AND HIGHLIGHT THE IMPORTANCE OF THESE PROGRAMS TO THE CONTINUED GROWTH OF EXPORT MARKETS FOR THE U.S. WOOD PRODUCTS INDUSTRY. I WILL ALSO PRESENT INDUSTRY RECOMMENDATIONS ON HOW CONGRESS CAN ENSURE THAT WOOD AND PROCESSED WOOD PRODUCTS BE ACCORDED FULL AND FAIR ACCESS TO THESE VALUABLE EXPORT FINANCING PROGRAMS.

LANGUAGE SUPPORTING FULL ACCESS WAS INCLUDED IN THE 1988 OMNIBUS TRADE BILL AND SUPPORTED BY A BROAD INDUSTRY COALITION INCLUDING SOUTHERN FOREST PRODUCTS ASSOCIATION, AMERICAN PLYWOOD ASSOCIATION, AND WESTERN WOOD PRODUCTS ASSOCIATION. UNFORTUNATELY, THE INDUSTRY CONTINUES TO BE BLOCKED FROM FULL ACCESS TO EXPORT FINANCING.

TARGETED EXPORT ASSISTANCE

THE TARGETED EXPORT ASSISTANCE (TEA) PROGRAM WAS CREATED IN THE 1985 FARM BILL AND WAS INTENDED TO PROVIDE ECONOMIC RELIEF TO U.S. COMMODITIES AGGRIEVED BY FOREIGN UNFAIR TRADE PRACTICES. OVER THE PAST FIVE YEARS, THIS PROGRAM ADMINISTERED BY THE USDA'S FOREIGN AGRICULTURAL SERVICE (FAS) HAS BECOME ONE OF U.S. AGRICULTURE'S MOST EFFECTIVE WEAPONS TO EXPAND EXPORTS. BY UTILIZING TEA ASSISTANCE IN COUNTRIES AS DIVERSE AS JAPAN, SPAIN, KOREA, TAIWAN, THE NETHERLANDS, THE DOMINICAN REPUBLIC, AND THE UNITED KINGDOM, THE U.S. WOOD PRODUCTS INDUSTRY HAS BEEN ABLE TO IMPROVE PERCEPTIONS AND GAIN ACCEPTANCE OF OUR PRODUCTS, AND DRAMATICALLY INCREASE EXPORT SALES, THEREBY REDUCING THE IMPACT OF UNFAIR FOREIGN TRADE PRACTICES.

UNFAIR TRADE PRACTICES OF FOREIGN COUNTRIES WILL CONTINUE TO BE OF CONCERN TO OUR INDUSTRY INTO 1990 AND BEYOND. TEA REMAINS ONE OF THE MOST EFFECTIVE WAYS TO REDRESS THESE CONCERNS. THE WOOD PRODUCTS INDUSTRY STRONGLY SUPPORTS THE REAUTHORIZATION OF TEA AT A FULL FUNDING LEVEL OF $325 MILLION ANNUALLY. WE ALSO BELIEVE CONGRESS SHOULD RESIST LEGISLATING NEW GUIDELINES FOR THE PROGRAM INSOMUCH AS USDA HAS ALREADY INTRODUCED SUFFICIENT CONTROLS AND ANY ADDITIONAL REGULATION WOULD REDUCE THE INDUSTRY'S FLEXIBILITY TO RESPOND QUICKLY TO EMERGING MARKET OPPORTUNITIES. THE INDUSTRY ALSO BELIEVES THAT IT IS IMPORTANT TO MAINTAIN TEA AS A

STAND ALONE PROGRAM, AND NOT MERGE TEA WITH THE FAS MARKET DEVELOPMENT PROGRAM.

CCC EXPORT FINANCING PROGRAMS

IN CONJUNCTION WITH THE FAS MARKET DEVELOPMENT PROGRAM, THE WOOD PRODUCTS INDUSTRY HAS BEEN SUCCESSFUL IN USING THE COMMODITY CREDIT CORPORATION'S (CCC) GSM 102 EXPORT FINANCING PROGRAM FOR SEVERAL YEARS. THE UTILIZATION OF THIS CREDIT PROGRAM HAS HELPED OPEN MARKETS IN FOREIGN COUNTRIES THAT WOULD NOT NORMALLY PURCHASE U.S. WOOD PRODUCTS. UNDER GSM 102, THE CCC PROVIDES CREDIT GUARANTEES TO A GROUP OF SELECTED COUNTRIES, ALLOWING U.S. EXPORTERS TO RECEIVE PAYMENT UPON SHIPMENT, WHILE THE BUYER GETS FINANCING. THE GSM 102 PROGRAM HAS BEEN OF GREAT BENEFIT TO THE WOOD PRODUCTS INDUSTRY AND WE SUPPORT ITS REAUTHORIZATION. HOWEVER, WE BELIEVE THE CURRENT FUNDING CAP OF $5 BILLION SHOULD BE RAISED TO AT LEAST $7 BILLION TO ASSURE ADEQUATE RESOURCES FOR NEW MARKET OPPORTUNITIES.

ONE EXAMPLE OF HOW THIS PROGRAM HAS BEEN USED SUCCESSFULLY TO OPEN FOREIGN MARKETS CAN BE FOUND IN THE WOOD PRODUCTS INDUSTRY'S EXPERIENCE WITH IRAQ. PRIOR TO OUR INDUSTRY'S USE OF CREDIT GUARANTEES, SALES OF WOOD PRODUCTS TO IRAQ NEVER REACHED $1 MILLION. SINCE APPROVAL FOR SHORT TERM CREDIT UNDER GSM 102 IN 1987, A VIRTUALLY NONEXISTENT MARKET HAS EXPANDED TO

APPROXIMATELY $160 MILLION IN WOOD PRODUCTS SALES TO IRAQ IN 1988. IRAQ BECAME OUR EIGHTH LARGEST MARKET FOR SOFTWOOD LUMBER.

HOWEVER, DESPITE THESE SUCCESSES, THE INDUSTRY HAS BEEN LIMITED TO LESS THAN THE FULL CREDIT TERMS AVAILABLE UNDER GSM 102, AND HAS NOT HAD ACCESS TO THE FULL RANGE OF EXPORT FINANCING AVAILABLE THROUGH INTERMEDIATE TERM CREDITS UNDER GSM 103, AND WITH TWO RECENT EXCEPTIONS, HAS NOT BEEN APPROVED FOR P.L. 480 TITLE ONE PROGRAMS.

IT HAS BEEN ARGUED THAT THE WOOD PRODUCTS INDUSTRY IS NOT ELIGIBLE FOR P.L. 480 PROGRAMMING BECAUSE THE PROGRAM IS INTENDED FOR USE WITH "FOOD COMMODITIES". FOR GSM 102, CREDIT TERMS FOR WOOD PRODUCTS HAVE BEEN LIMITED TO NO MORE THAN 2 YEARS AND OFTEN ONLY ONE YEAR, WHEREAS THE TERMS FOR OTHER AGRICULTURAL PRODUCTS ARE LONGER. ACCESS TO INTERMEDIATE CREDIT TERMS UNDER GSM 103 HAVE BEEN COMPLETELY DENIED TO OUR INDUSTRY.

AN INCREASED DEMAND FOR WOOD AND WOOD PRODUCTS OVERSEAS HAS INCREASED EXPORT SALES DRAMATICALLY, AND A LARGE POTENTIAL EXISTS THROUGH HOUSING AND SHELTER PROGRAMS INITIATED IN LATIN AMERICA AND OTHER DEVELOPING COUNTRIES. HOWEVER, TO FURTHER THESE PROGRAMS, THE INDUSTRY NEEDS LOW INTEREST CREDIT AND LONG-TERM CREDIT GUARANTEE PROGRAMS, OTHERWISE THESE MARKETS DEVELOPED BY OUR INDUSTRY WILL BE LOST TO OTHER COUNTRIES THAT PROVIDE EASY CREDIT AND OTHER INCENTIVES. FULL ACCESS TO USDA CREDIT PROGRAMS

COULD MEAN SEVERAL HUNDRED MILLION DOLLARS IN NEW SALES FOR THE INDUSTRY WITH THE POTENTIAL FOR DEVELOPING SIGNIFICANT NEW MARKETS FOR THE FUTURE.

ARGUMENTS FOR EXCLUSION

THE MAIN ARGUMENT FOR EXCLUDING WOOD AND PROCESSED WOOD PRODUCTS FROM USING THE FULL RANGE OF FINANCING CENTERS ON WHETHER WOOD AND PROCESSED WOOD PRODUCTS ARE RIGHTLY CONSIDERED "AGRICULTURAL" PRODUCTS. SOME GOVERNMENT AGENCIES ARGUE THAT WOOD AND PROCESSED WOOD PRODUCTS ARE NOT AGRICULTURAL, BUT INSTEAD MANUFACTURED PRODUCTS. UNDER THIS DEFINITION, THE U.S. MIGHT BE PERCEIVED AS DEVIATING FROM EXISTING INTERNATIONAL GUIDELINES IF IT WERE TO USE MORE THAN TWO YEAR GSM 102 CREDIT GUARANTEES FOR WOOD PRODUCTS.

HOWEVER, THE UNITED STATES DEPARTMENT OF AGRICULTURE AND THE WOOD PRODUCTS INDUSTRY BELIEVE THERE IS OVERWHELMING PRECEDENT FOR CLASSIFYING WOOD AND PROCESSED WOOD PRODUCTS AS AN AGRICULTURAL PRODUCT ELIGIBLE FOR THE FULL RANGE OF USDA CREDIT GUARANTEES. U.S. AGRICULTURAL POLICY IN THE GATT HAS INCLUDED FOREST PRODUCTS AS AN AGRICULTURAL PRODUCT. THE GATT RULES ALLOW EACH NATION TO DETERMINE WHICH PRODUCTS SHALL BE CLASSIFIED AS AGRICULTURAL. CONGRESS HAS ALSO EXPRESSED ITS INTENT THAT WOOD PRODUCTS BE CLASSIFIED AS "AGRICULTURAL" THROUGH CONGRESSIONAL AND

SUBCOMMITTEE REPORT LANGUAGE, STATEMENTS OF INTENT, AND STATUTORY LANGUAGE IN THE 1988 OMNIBUS TRADE ACT.

THE OPPOSITION TO THE WOOD PRODUCTS INDUSTRY'S USE OF P.L. 480 IS DIFFERENT FROM THE ONE RAISED AGAINST THE GSM PROGRAMS. HERE THE KEY ARGUMENT IS THAT P.L. 480 IS STRICTLY FOR USE WITH FOOD PRODUCTS. HISTORICALLY THE PROGRAM HAS BEEN USED FOR FOOD ITEMS AND SOME FEEL IT SHOULD REMAIN SO.

THE WOOD PRODUCTS INDUSTRY BELIEVES IT IS IMPORTANT TO UNDERSTAND THAT P.L. 480 IS A "DEVELOPMENTAL PROGRAM" FOR USE IN COUNTRIES THAT ARE IN NEED OF THE NECESSITIES OF LIFE. IT IS OUR CONTENTION THAT THE NECESSITIES OF LIFE INCLUDE NOT ONLY FOOD, BUT ALSO CLOTHING AND SHELTER -- AND THERE IS HISTORICAL PRECEDENTS FOR USE OF P.L. 480 PROGRAMMING FOR NON-FOOD ITEMS.

RECOMMENDATIONS

THE WOOD PRODUCTS INDUSTRY BELIEVES THERE IS A NEED FOR CONGRESS TO FURTHER SPECIFY THE LANGUAGE ON THE USE OF WOOD PRODUCTS UNDER GSM 102, GSM 103, AND P.L. 480. WHILE PROVISIONS INCLUDED IN THE 1988 TRADE ACT (P.L. 100-418) WERE INTENDED TO CLARIFY THE ELIGIBILITY OF WOOD PRODUCTS FOR EXPORT FINANCING, THE LANGUAGE CONTAINED WITHIN THE ACT DOES NOT SPECIFICALLY MANDATE THEIR USE. HENCE, THE VAGUENESS OF CERTAIN AREAS OF THE LAW HAVE BEEN USED

TO DEFY THE INTENT OF CONGRESS THAT WOOD AND PROCESSED WOOD PRODUCTS BE ACCORDED FULL AND FAIR ACCESS TO THESE PROGRAMS.

OUR INDUSTRY WOULD LIKE TO SUGGEST THE FOLLOWING STEPS THAT CONGRESS MAY WANT TO CONSIDER IN ORDER TO HELP ACHIEVE FULL AND FAIR ACCESS FOR WOOD PRODUCTS.

1. CONGRESS SHOULD CONSIDER STATUTORY LANGUAGE MANDATING THE ACTIVE USE OF ALL USDA CONCESSIONAL (P.L. 480) AND CREDIT GUARANTEE (GSM 102/103) PROGRAMS TO PROMOTE THE EXPORT OF ALL SEMI-PROCESSED AND PROCESSED WOOD PRODUCTS AS SET FORTH IN THE HARMONIZED SYSTEM, CHAPTER 44.

2. ADDITIONAL STATUTORY LANGUAGE SHOULD BE CONSIDERED TO DEFINE WOOD AND PROCESSED WOOD PRODUCTS AS AGRICULTURAL COMMODITIES, AND AS SUCH, CERTIFY THEIR ELIGIBILITY FOR THE FULL RANGE OF EXPORT CREDIT GUARANTEES WITH THE SAME TERMS AND CONDITIONS AVAILABLE TO ALL OTHER AGRICULTURAL PRODUCTS.

3. CONGRESS SHOULD HELP PRECLUDE FURTHER CHALLENGES TO THE USE OF EXPORT FINANCING FOR WOOD PRODUCTS BY PROVIDING THE SECRETARY OF AGRICULTURE WITH THE MANDATE AND FULL AUTHORITY TO FULLY UTILIZE THE EXPORT CREDIT GUARANTEE PROGRAM FOR WOOD PRODUCTS.

4. **CONGRESS SHOULD CLARIFY THAT PROVIDING WOOD PRODUCTS FOR SHELTER IS BOTH A HUMANITARIAN AND EXPORT DEVELOPMENT ACTIVITY FULLY ELIGIBLE FOR FUNDING UNDER THE P.L. 480 PROGRAM.**

CONCLUSION

THE WOOD AND WOOD PRODUCTS INDUSTRY IS AN INTERNATIONALLY COMPETITIVE, EXPORT ORIENTED INDUSTRY COMMITTED TO CONTINUED GROWTH IN OVERSEAS MARKETS. THE KEY TO LONG TERM DEVELOPMENT OF ADDITIONAL EXPORT MARKETS IN LESS DEVELOPED, DEVELOPING, AND INTERMEDIATE INCOME COUNTRIES IS ACCESS TO FINANCING. OUR INDUSTRY BELIEVES IT IS CRITICAL THAT THE DIRECTIVES OF CONGRESS BE FOLLOWED AND THAT WOOD AND PROCESSED WOOD PRODUCTS BE ALLOWED -- LIKE ANY OTHER AGRICULTURAL PRODUCT -- TO UTILIZE THESE GOVERNMENT SPONSORED FINANCING PROGRAMS TO THE FULLEST EXTENT POSSIBLE. THIS CONCLUDES MY ORAL STATEMENT. OUR INDUSTRY IS GRATEFUL FOR THE OPPORTUNITY TO TESTIFY ON THIS IMPORTANT ISSUE. I WOULD BE HAPPY TO ANSWER ANY QUESTIONS THAT YOU MAY HAVE.

Senator FOWLER. We are going to meet in room 385, Russell Senate Office Building, down the hall, at 2 o'clock. Thanks to everyone.

[Whereupon, at 10:45 a.m., the subcommittee adjourned, to reconvene at 2 p.m., the same day.]

AFTERNOON SESSION

Senator FOWLER. We will resume our hearing on State and Private Forestry. Welcome to the witness table, Dr. Larry W. Tombaugh, the president of the National Association of Professional Forest Schools and Colleges in Raleigh, and Dr. Albert R. Vogt, the director of the School of Forestry, Fisheries and Wildlife at the University of Missouri. Gentlemen, I thank you again and apologize for the inconvenience, and thank you for reorganizing your schedule. Dr. Tombaugh, would you like to go first? Of course your full prepared statement will be made a part of the record, and if you would like to summarize and proceed as you will.

STATEMENT OF LARRY W. TOMBAUGH, PRESIDENT, NATIONAL ASSOCIATION OF PROFESSIONAL FORESTRY SCHOOLS AND COLLEGES, RALEIGH, NC

Dr. TOMBAUGH. Thank you, Mr. Chairman. I appreciate the chance to do that.

Before I begin the comments, though, I really do wish to commend you, sir, for the leadership role that you played recently in the forestry picture. We very much appreciate the role you have been playing.

Senator FOWLER. Thank you very much.

COMMENTS WILL BE RESTRICTED TO TITLE XIV OF THE FARM BILL

Dr. TOMBAUGH. I am going to restrict my comments to title XIV of the farm bill, the section that has historically dealt with education, research, and extension in agriculture and forestry. We, that is the 60 forestry schools and colleges in the United States, propose that a subtitle be added to title XIV that will explicitly promote the health, vitality, productivity, and environmental quality of that one-third of the Nation's land that is forested. These lands and their associated renewable natural resources have become the focal point of controversy and clashes of values among different segments of the American public—clashes that are unique to forested environments and that in our view warrant special legislative attention.

The American public is increasingly concerned about the compatibility between the use of forests for commercial purposes and the quality of the environment. The United States pioneered the concept of wilderness preservation many years ago, and now over 90 million acres of land have been preserved for wilderness. The pressures continue to mount to designate additional areas.

At the same time, U.S. forests support an industry that adds $73 billion to the value of the U.S. economy each year and employs over 1½ million people. This represents 7.3 percent of the value added in all manufacturing and 8½ percent of all people employed in U.S. manufacturing, and the largest share of these people are employed in rural America. Also, forest-based tourism and recreation are the primary local industries for thousands of communities. An average of 550 million visitor days of outdoor recreation use has occurred on Federal lands each year throughout the 1980's. It is essential that these important industries continue to be strengthened.

Because forested lands are the source of most of the surface water in the United States, there is a direct relationship between forest management practices and water quality. There is also evidence of a relationship between forests and climate, and rising concern about global warming is focusing attention on the importance of forests in the United States and in tropical regions throughout the world. Concern about the need for biologically diverse ecosystems and for preserving rare and endangered species of plants and animals is growing. Forests provide much of the habitat for game and nongame wildlife species.

Urban dwellers, too, are becoming more and more concerned about trees. Urban forestry has become a big business as city governments and residents seek care for the trees that enhance their environment and the value of their parks and property.

Commercial uses of forested wetlands is a matter of intense debate because of potential damage to fresh water and estuarine environments. And I can assure you in our State of North Carolina, 70 percent of the forests in our State, the productive forests, are growing on areas that could be classified as forest wetlands. The maintenance of forest health in the face of increased regional and global air pollution, altered pest distribution patterns, and human encroachment is recognized to be a priority need if forest cover and wood supply are to be maintained. These and other issues put forested ecosystems in the forefront of the public environmental agenda.

The subtitle that we propose does two things:

First, it clarifies and confirms the authority of the Secretary of Agriculture to conduct and support education, research, extension, and international programs dealing with environmental as well as commodity issues associated with forested lands so that a scientific basis for decisionmaking can be developed. We are concerned that, too often, decisions are based on emotion and hysteria, rather than fact.

Second, our proposed subtitle calls for specific programs to enhance the capability of the Nation's forestry schools and colleges to deal with these critical issues. It calls for a reaffirmation of the Federal-State partnership that has been so important to forestry research and, particularly, it seeks authorization of the McIntire-Stennis Cooperative Forestry Research Program, a program that is absolutely critical to the conduct of research in our Nation's forestry schools. It calls for a major grants program to expand research on specific scientific issues. It also calls for a facilities grant program in recognition that the physical facilities and research equipment at many research stations and forestry schools are simply inadequate.

It calls for continued authority of the Renewable Resources Extension Act (RREA) and a national advisory group composed of representatives of the forest products industry, environmental organizations, wildlife and fishery interests, range, and other organizations to advise the Secretary about directions of this important program. This program, by the way, I was pleased to hear the Secretary's representative reconfirm the desire to maintain existing delivery systems. This is a delivery system for educational services that is available for programs like America the Beautiful, environmental education programs, and many, many others.

Our proposed subtitle calls for a graduate fellowship program to increase the supply of scientific manpower in the sciences critical to forestry. Also needed is an undergraduate fellowship program to enable us to increase the number of women and minority professionals in forestry, natural resource and related environmental disciplines.

Finally, our proposed subtitle calls for a grants program to enhance research, education, and technology transfer activities in tropical forest management, agroforestry, and international forestry.

I have provided the committee with a copy of the details of our proposed subtitle. I am also providing a copy of two publications[4] that describe research and extension programs in forestry.

All of us responsible for the Nation's forestry education and research programs seek your support for this proposed subtitle. We thank you for the opportunity to present these thoughts.

Senator FOWLER. Thank you, Dr. Tombaugh, again, that is for the specifics included in your proposal which we will give serious attention to and we will discuss in a moment.

[The prepared statement and proposed subtitle of Dr. Tombaugh follow:]

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[4] The publications: Extension In Action: Conserving and Managing Our Nation's Forest Resources, July 1989, Extension Service and Land-Grant University, Cooperative Extension Services by Mary L. Duryea, Assistant Professor and Extension Specialist, Department of Forestry, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, FL 32611 and Frederick J. Deneke, National Program Leader for Wood Products Marketing, U.S. Department of Agriculture, Extension Service, Natural Resources and Rural Development, Washington, DC 20250-0900; and Forests for America's Future, A Research Program for the 1990s, USDA Forest Service, National Association of Professional Forestry Schools and Colleges, USDA Cooperative State Research Service, June 1989 are retained in the subcommittee file.

TESTIMONY BEFORE THE
SENATE COMMITTEE ON AGRICULTURE, NUTRITION, AND FORESTRY
SUBCOMMITTEE ON CONSERVATION AND FORESTRY

March 1, 1990

My name is Larry W. Tombaugh and I am Dean of the College of Forest Resources at North Carolina State University. I am also serving as President of the National Association of Professional Forestry Schools and Colleges, an organization that represents the 60 schools and colleges of forestry and related natural resources in the United States. It is in this latter capacity that I have the privilege of appearing before you today.

My comments will be restricted to Title XIV of the Farm Bill, the section that has historically dealt with education, research, and extension in agriculture and forestry. We propose that a subtitle be added to Title XIV that will explicitly promote the health, vitality, productivity, and environmental quality of that one-third of the nation's land that is forested. These lands and their associated renewable natural resources have become the focal point of controversy and clashes of values among different segments of the American public -- clashes that are unique to forested environments and that warrant special legislative attention.

The American public is increasingly concerned about the compatibility between the use of forests for commercial purposes and the quality of the environment. The United States pioneered the concept of wilderness preservation, and over 90,000,000 acres have now been officially designated as pristine areas in which commercial activities are forbidden. Pressures continue to mount to designate additional land area for wilderness.

At the same time, U.S forests support an industry that adds about 73 billion dollars to the value of the U.S. economy each year and employs over a million and a half people.

This represents 7.3% of the value added in all manufacturing and 8.5% of all people employed in U.S. manufacturing with the largest share being employed in rural America. Products include essential commodities such as pulp, paper, lumber, plywood, particleboard, furniture, and hundreds of others. Also, forest-based tourism and recreation are the primary local industries for thousands of communities. An average of 550 million visitor days of outdoor recreation use has occurred on federal lands each year throughout the 1980's. It is essential that these important industries continue to be strengthened.

Because forested lands are the source of most of the surface water in the United States, there is a direct relationship between forest management practices and water quality. There is also evidence of a relationship between forests and climate, and rising concern about global warming is focusing attention on the importance of forests in the United States and in tropical regions throughout the world. Concern about the need for biologically diverse ecosystems and for preserving rare and endangered species of plants and animals is growing. Forests provide much of the habitat for game and non-game wildlife species.

Urban dwellers, too, are concerned about trees. Urban forestry has become a big business as city governments and residents seek care for the trees that enhance their environment and the value of their parks and property.

Commercial uses of forested wetlands is a matter of intense debate because of potential damage to fresh water and estuarine environments. The maintenance of forest health in the face of increased regional and global air pollution, altered pest distribution patterns, and human encroachment is recognized to be a priority need if forest cover and wood supply are to be maintained. These and other issues put forested ecosystems in the forefront of the public environmental agenda.

The subtitle that we propose does two things. First, it clarifies the authority of the Secretary of Agriculture to conduct and support education, research, extension, and international programs dealing with environmental as well as commodity issues associated with forested lands so that a scientific basis for decision-making can be developed. We are concerned that, too often, decisions are based on emotion and hysteria, rather than fact. Second, it calls for specific programs to enhance the capability of the nation's forestry schools and colleges to deal with these critical issues. It calls for a reaffirmation of the Federal-State partnership that has been so important to forestry research and, particularly, it seeks reauthorization of the McIntire-Stennis Cooperative Forestry Research Program. It calls for a major research grants program to expand on specific scientific issues. It also calls for a facilities grants program in recognition that the physical facilities and research equipment at many research stations and forestry schools are inadequate.

It calls for continued authority of the Renewable Resources Extension Act and a national advisory group composed of representative of the forest products industry, environmental organizations, wildlife and fishery interests, range, and other organizations to advise the Secretary about directions of this important program.

It calls for a graduate fellowship program to increase the supply of scientific manpower in the sciences critical to forestry. Also needed is an undergraduate fellowship program to enable us to increase the number of women and minority professionals in forestry , natural resource and related environmental disciplines.

Finally, our proposed subtitle calls for a grants program to enhance research, education, and technology transfer activities in tropical forest management, agroforestry, and international forestry.

I have provided the Committee with a copy of the details of our proposed subtitle. All of us responsible for the nation's forestry education and research programs seek your support. Thank you for the opportunity to offer these thoughts.

Subtitle __ --Forestry, Natural Resources, and the Environment

FINDINGS

SEC. xxxx. Congress finds that --

(a) the forests in the United States support an industry that adds about $73,000,000,000 to the value of the national economy and employs 1,580,000 people as well as provides forest-based tourism and recreation as the primary industry for thousands of localities and communities;

(b) urban forestry has become a major economic and industry force as city governments and residents seek to care for trees enhancing the environmental quality and property values of urban areas;

(c) the production of food, fiber, industrial products, basic human sustenance, and viable export markets depend upon the nation's sustainable and renewable productive natural resources;

(d) domestic and international demands for food, fiber, fish and wildlife, and a quality environment (including clean air and water, open space, natural areas, fish and wildlife habitats, wetlands and endangered species maintenance, landscape conservation aesthetics, and recreational opportunities) generate intense pressures on the nation's forests and renewable resources;

(e) the United States pioneered the concept of wilderness and more than 90,000,000 acres of forest lands has been designated as pristine areas in which commercial activities are prohibited;

(f) there is an increasing concern about the compatibility between the use of forests for commercial purposes and maintaining the environment's quality;

(g) this growing level of environmental awareness in America is shifting public attention to a variety of important issues related to the management of forests and other renewable natural resources and that will likely have a significant impact on those economically important industries depending upon the forest resource;

(h) forests and their associated natural resources have become the focal point of controversy and conflicts of values among different segments of the American public, and these conflicts and issues -- including the assurance that the forest industry remains competitive in the world marketplace and its importance to the economy of the United States, the relationship between managed forests and water, the importance of forests to climatic and global changes, the role of forests in the preservation of biological diversity and rare and endangered species, the provision of major habitats for game and non-game species, management systems for forested wetlands, forest health and air pollution, and the role of forests in the urban environment -- are unique to forested environments and warrant special legislative attention;

(i) global climate change is a threat to the world but can be mitigated by establishing tree and forest cover in communities and rural areas and by keeping forest lands in a productive and healthy condition;

(j) nearly two-thirds of the commercial forest land in the United States is in private ownership, nearly one-half of the nation's wood supply comes from non-industry owned lands and this percentage will increase in the future, two-thirds of wildlife and fisheries habitat is located on private lands, and more than one-third of the nation's forest lands are in need of some type of conservation treatment;

(k) the products and services resulting from the nation's air and water quality and the quality and quantity of wetlands and other habitats must be maintained and improved through effective management of all forest resources, because these resources are major contributors to the economic health and diversity of rural communities; and,

(l) proper management of the nation's forest lands is a long-term commitment by landowners and all consumers which requires both encouragement by and assistance from state and federal governments.

PURPOSES

SEC. xxxx. The purposes of this subtitle are to --

(a) promote the health, vitality, productivity, natural resources, and environmental quality of the one-third of the nation's land areas that are forested which are of vital importance to the economy, related natural resources, quality of life, and environmental quality of the United States;

(b) coordinate and integrate the efforts of the various agencies in the Department of Agriculture (Agricultural Stabilization and Conservation Service, Cooperative States Research Service, Cooperative Extension Service, the Forest Service, Soil Conservation Service, etc.) with other appropriate federal and state agencies in providing the expertise and experience that can help the owners of privately-held forest resources achieve stated goals while, at the same time, provide significant public benefits;

(c) establish and deliver a coordinated and comprehensive interagency forest resources program that will encourage owners, managers, and users to better protect, regenerate, and improve the overall condition of the nation's privately-held forest lands and their attendant resources;

(d) provide a balanced mix of research, extension and education, technical assistance, and financial assistance to achieve the goals and purposes of this subtitle in an efficient and coordinated effort;

(e) increase research and educational programs to improve the development of forest policies and management systems for production and utilization of forest resources such as fiber, water, wilderness and recreation, biological diverse ecosystems (including rare and endangered species and game and non-game wildlife habitat and forage);

(f) expand the research, extension, and education programs essential to achieving the purposes of this subtitle being conducted at colleges and universities having accredited schools or colleges of forestry and at State agricultural experiment stations and cooperative extension service programs conducting forestry and related natural resources research;

(g) stabilize global climate change;

(h) promote the effective and efficient management of forest resources for the diversity of public needs, demands, and values; and,

(i) enhance the understanding and processes for resolving public conflicts pertaining to the compatibility of commercial-use forests with related natural resources and environmental quality.

AUTHORIZATION TO THE SECRETARY OF AGRICULTURE

SEC. xxxx. In order to carry out the purposes and responsibilities of this subtitle, the Secretary of Agriculture is authorized to --

(a) cooperate with, encourage, and assist the States in carrying out programs in forestry, natural resources, and the environment for education, research, and extension in the manner described hereinafter in this Act and subtitle;

(b) implement programs that respond to and integrate the needs established and programs called for in the Resources Planning Act, the Resources Conservation Act, the Forestry Research Act, the Renewable Resources Extension Act, the Rural Forestry Assistance Act, the Clean Water Act, the Rare and Endangered Species Act, the Conservation Title of the 1985 Food Security Act and the conservation provisions of this Act, the Urban Forestry Act, and the Global Climate Change Act (to be named);

(c) establish an interagency committee composed of representatives from the respective agencies included in Section xxxx(b) for the purposes of coordinating program development, budgeting, and implementation;

(d) encourage owners, managers, and users to adopt and implement environmentally and economically sound management practices;

(e) encourage owners and managers to take a "total resource" approach to their production enterprises so that forest resources become an integral part of sustained management/production systems;

(f) make producers aware of "critical areas" and concerns relative to habitat for rare and endangered species and assist producers in formulating viable strategies for regenerating and improving these valuable resources;

(g) inform landowners about native crops and products that can be produced from the forest resources associated with local crops, pastures, ranges, and associated lands and waters, as well as assist landowners in developing viable economic production/marketing systems for these products;

(h) educate community leaders, homeowners, and volunteers about the value of trees in conserving energy and their positive contribution to the reduction of global warming and atmospheric pollution;

(i) encourage and assist voluntary efforts to increase tree plantings in urban areas; and,

(j) speed the research, education, adoption, and application of environmentally and economically sound forest resources technology in the management of crop, pasture, forest, range, and related lands and their attendant natural resources in rural areas and communities.

FORESTRY, NATURAL RESOURCES, AND ENVIRONMENTAL RESEARCH

SEC. xxxx. (a) The importance of the Act of October 10, 1962 (16 U. S. C. 582 a et seq.), commonly known as the McIntire-Stennis Cooperative Forestry Act, is reaffirmed and the authorization for appropriation is increased to ______.

(b) There are authorized to be appropriated funds for a competitive forestry, natural resources, and environment grants program to meet the critical needs identified in this subtitle. The Secretary may make grants, for periods not to exceed five years, to State agricultural experiment stations, colleges and universities, other research institutions and organizations, federal agencies, private organizations, or corporations which have a demonstrable capacity to conduct forestry, natural resources, and environmental research as determined by the Secretary. Initial priorities for such research shall include --

(1) biology of forest organisms, including physiology, genetic mechanisms, and biotechnology;

(2) ecosystem function and management, including forest ecosystem research, biodiversity, long-term productivity, pest management, and alternative silivicultural systems;

(3) wood as a raw material, including forest products and harvesting;

(4) human-forest interactions, including outdoor recreation, public policy formulation, economics, sociology, and administrative behavior;

(5) international trade, competition, and cooperation;

(6) energy, water, and agricultural chemical reduction to improve net farm income, protect the environment and meet the constant economic and technical changes in agriculture and rural America;

(7) alternative native crops, products, and services that can be producted from the renewable natural resources associated with privately-held forest lands;

(8) viable economic production and marketing systems for alternative natural resource products and services;

(9) economic and environmental benefits of various conservation practices (e.g. windbreaks) on forests and croplands; and,

(10) economic and environmental impacts of global climate change on the forest lands and other conservation measure to reduce global climate change.

The Secretary shall request the Cooperative Forestry Research Council, defined in Section 5(b) of the Act of October 10, 1962 (16 U. S. C. 582-a-4 and 582-a-5), as amended, to provide recommendations regarding grant priorities.

(c) There are authorized to be appropriated funds for the updating of physical facilities and research equipment at eligible institutions defined in Section ____ of this subtitle to facilitate the conduct of state-of-the-art research in forestry, natural resources, and the environment for the purposes of this subtitle. The Secretary is authorised to develop criteria and priorities for the allocation of such funds using the guidance of the Cooperative Forestry Research Council defined in the preceding Section ____(b).

FORESTRY, NATURAL RESOURCES AND ENVIRONMENTAL EXTENSION PROGRAMS

SEC. xxxx. (a) This section shall expand the program definition, increase the authorization of appropriations to ____, and reaffirm the importance of the Renewable Resources Extension Act of 1978 (Public Law 95-306). This Act is hereby amended to include environmental education as a program component and to provide the Secretary a leadership role in environmental education through the Cooperative Extension Service. Authorization for appropriations in the amount as may be necessary to implement this section is granted to respond to current educational needs as defined in this Act and to provide for increased program emphasis on environmental education.

(b) The Secretary shall establish a national advisory council to provide recommendations to the Secretary on program priorities. The council shall be composed of representatives of the forest products industry, agricultural industry, environmental and conservation organizations, wildlife and fisheries interests, range and other organizations with interests and expertise in forestry, natural resources, and the environment.

(c) Educational and extension programs shall be developed and implemented by the Secretary, through the Cooperative Extension Service, that include, but are not limited to, information and extension systems that --

(1) increase the awareness of landowners about the economics of timber production;

(2) enhance awareness of alternative methods of forest regeneration;

(3) provide information about alternatives for managing CRP lands, including for forestry purposes, and information about converting CRP pastures and grasslands to trees;

(4) provide continuing education for tree nursery operators;

(5) develop, in conjunction with the Forest Service and Soil Conservation Service, an Urban Tree Planting Component to conserve energy and reduce air pollution in urban and community areas;

(6) encourage the planting and care of trees in urban areas by educating residents about the benefit of urban trees;

(7) conduct a comprehensive environmental education program enabling citizens to participate in environmentally-sound activity such as tree planting, recycling, erosion prevention, etc.;

(8) conduct mass media enviromnental education with special emphasis on the nation's youth;

(9) teach the need for maintaining biodiversity and how individuals can contribute to this effort;

(10) demonstrate sustainable natural resources systems and teach the concepts of natural resources sustainability;

(11) provide the most current information available about major environmental issues (e.g. global change, acid rain, endangered species, etc.);

(12) train natural resources professionals in the techniques of environmental education;

(13) provide educational programs for landowners and managers on sustainable natural resources and environmental management;

(14) teach environmentally-sound harvesting alternatives to landowners and managers;

(15) provide landowner education on the environmental implications of forestry practices, giving special attention to environmentally-sensitive areas such as wetlands and riparian areas;

(16) emphasize wildlife management, recreation, soil and water conservation, and other multiple-use aspects of forestry;

(17) inform owners of opportunities for participating in easements;

(18) explain tax implications of forestry practices;

(19) encourage citizens to become informed participants in formulating public policy relative to the management of forests and natural resources;

(20) improve the capacity of local agencies to deliver forestry and natural resources information through the Department's agents, representatives, and others engaged in forestry and natural resources management;

(21) provide accurate, unbiased information about current incentive programs;

(22) encourage the transfer of information through volunteers, such as the master woodland owner program in which the volunteer is provided comprehensive information in exchange for agreeing to teach other forest owners;

(23) provide continuing education for forestry professionals who work with landowners and for agriculture leaders who participate in the formulation of public policy;

(24) train agents or representatives of the Department to integrate forest planning into their land management activities; and,

(25) encourage rural development agencies to promote forestry.

FORESTRY, NATURAL RESOURCES, AND ENVIRONMENTAL EDUCATION

SEC. xxxx. (a) There are authorized to be appropriated such sums as may be necessary to expand the professional education of forestry, natural resources, and environmental scientists for the purposes of this subtitle. To accomplish the goal of ensuring an adequate pool of scientific manpower, the Secretary shall --

(1) provide funds for a competitive grant fellowship program for graduate students attending institutions having demonstrable graduate programs in forestry, natural resources, and the environment; and,

(2) provide funds for a competitive grant fellowship program for undergraduate minority and women students attending institutions having demonstrable undergraduate programs in forestry, natural resources, and the environment.

(b) In Section ____(a)(the preceding section), the following areas should be given priority --

(1) biology of forest organisms;

(2) ecosystem function and management;

(3) human-forest interactions;

(4) international trade, competition, and cooperation; and,

(5) wood as a raw material.

FORESTRY, NATURAL RESOURCES, AND ENVIRONMENTAL INTERNATIONAL PROGRAMS

SEC. xxxx. There are authorized to be appropriated funds to establish a competitive grant program to colleges and universities in the United States and overseas cooperators having demonstrable capabilities to conduct research, education, and technology transfer activities in international forestry, natural resources, and the environment. The Secretary shall administer this competitive grant program in consultation with the Secretary of State to --

(1) conserve forest ecosystems, maintain the bio-

logical diversity they contain, and mitigate possible adverse consequences of global change through improved understanding of forest ecology and management;

(2) incorporate trees into farming and grazing systems through agroforestry and social forestry to improve local economies and environments;

(3) improve local availability of fodder, food, and fuel through selection and breeding of fast-growing multipurpose species;

(4) conserve forest resources and improve economic conditions through utilization of wood from natural forests and plantations; and,

(5) improve the implementation of forest management strategies, agroforestry systems and technologies through analysis and strengthening of forest policies and institutions.

Senator FOWLER. Dr. Vogt, am I saying it right?

Dr. VOGT. Yes, you are, thank you.

Senator FOWLER. I got that. I was listening to Senator Bond this morning. We welcome you. Please proceed.

STATEMENT OF ALBERT R. VOGT, DIRECTOR, SCHOOL OF FORESTRY, FISHERIES, AND WILDLIFE, UNIVERSITY OF MISSOURI, COLUMBIA, MO

Dr. VOGT. Thank you.

INTRODUCTION

Mr. Chairman, I am honored to follow my respected colleague, Dr. Tombaugh, and to represent the National Educational Committee of the National Association of Professional Forestry Schools and Colleges.

THE FORESTRY INITIATIVES PROPOSED TO BE INCLUDED AS SUBTITLE XIV

The forestry initiatives proposed to be included as subtitle XIV, national resources and the environment, are both the pride and the responsibility of the Secretary of Agriculture.[5] They deserve subtitle status in the farm bill because of their importance to the future of our Nation and the world's natural resources. These Federal resources have been wisely invested in universities to provide research and education needed to manage our natural resources.

THESE INVESTMENTS HAVE CATALYZED ADDITIONAL NON-FEDERAL FUNDING

These investments have catalyzed additional non-Federal funding. For example, for every dollar of McIntire-Stennis funds, there has been an additional investment of five State and private dollars. For every dollar of RREA, Renewable Resources Extension Act funds, an additional $2.50 have been added by the States. These programs support research and extension, but they also assist in training future stewards of our world's environment to deal with the emerging environmental problems of atmospheric pollution, global warming, agroforestry, biological diversity, forest protection and others. It is appropriate, I believe, that Subtitle XIV become part of the 1990 farm bill.

NAPFSC'S DISAPPOINTMENT AT PRESIDENT BUSH'S RECENT BUDGET REQUEST FOR FISCAL YEAR 1991

I believe we would be remiss today, Mr. Chairman, if we did not also take this opportunity to express NAPFSC's disappointment at President Bush's recent budget request for fiscal year 1991 which calls for a cut of nearly 25 percent in funding for the McIntire-Stennis Cooperative Research Program from last year's level, and the zeroing out of the RREA program. For several years, the McIntire-Stennis program has been funded at $17.5 million, and the RREA program has been funded at $2.765 million. The strongest support for these programs has come from the Senate Appropriations Committee where $25 million was approved for McIntire-Stennis in fiscal year 1988 and $20 million in fiscal year 1989. This year, I understand, that the Cooperative State Research Service and the USDA recommended maintaining the current funding level for McIntire-Stennis but were overridden by OMB. I bring this to your attention, Senator Fowler, since you are also a member of the Agriculture Appropriations Subcommittee, and you, along with Senator Cochran and other supporters of forestry in the subcommittee, have worked in the past years to ensure that adequate funds are provided for McIntire-Stennis and RREA.

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[5] See pp. 304 to 313.

CONCLUSION

We certainly thank you for your efforts there, and I hope on behalf of these critical programs, and I urge that the Senate once again provide support for McIntire-Stennis in RREA. Thank you.

[The prepared statement of Dr. Vogt follows:]

TESTIMONY BEFORE THE

SENATE CONSERVATION AND FORESTRY SUBCOMMITTEE

by

DR. ALBERT R. VOGT

DIRECTOR, SCHOOL OF FORESTRY, FISHERIES, AND WILDLIFE

UNIVERSITY OF MISSOURI

on behalf of

THE NATIONAL ASSOCIATION OF PROFESSIONAL FORESTRY
SCHOOLS AND COLLEGES

MARCH 1, 1990

Mr. Chairman, members of the Subcommittee, my name is Dr. Albert R. Vogt. I am the Director of the School of Forestry, Fisheries, and Wildlife at the University of Missouri. I appreciate this opportunity to present testimony in tandem with Dr. Larry Tombaugh. It is my intention to add to the points made by Dr. Tombaugh.

I represent the Universities and Colleges across the nation that receive funding through the McIntire-Stennis Cooperative Forestry Research Program, the Renewable Resources Extension Act and the USDA Competitive Grants programs. I hope to impress upon you the importance and clear rationale for including these forestry initiatives as a separate subtitle of Title XIV of the 1990 Farm Bill.

These forestry-related federal initatives are extremely important to forestry research programs throughout the country. They provide a continuum of information needed to solve environmental problems through research, supported by McIntire-Stennis and Competitive Grants, and through environmental education, supported by RREA, that lead to the transfer of new information into the management of our precious natural resources.

It is important that the Secretary of Agriculture have McIntire-Stennis, RREA, and Forestry Competitive Grants in the Farm Bill, visible to the public, as we carry out the their mandate to properly manage the nation's natural resources.

Prior to the existence of McIntire-Stennis, RREA and USDA Forestry Competitive Grants, forestry research and extension programs struggled to support the programs needed to properly manage and use the extensive forest resources in this country. The federal McIntire-Stennis, RREA, and competitive grants programs have been wisely directed toward research and extension educational programs applicable to the broad spectrum of forest resources, including timber, water quality, range and wildlife management and recreation.

These funds have been used to markedly increase support for forest resource management programs at the universities. For every dollar of McIntire-Stennis research funding the State and Private sectors have contributed five dollars. For RREA the figure is one dollar RREA to two and one-half State and Private dollars. The cost effectiveness of McIntire-Stennis and RREA funds is only part of the success story. These funds make possible the training of graduate students in forest resource areas. These graduates will provide research and educational services to the next generation to assure environmental quality.

Nearly all faculty at universities who benefit from RREA or McIntire-Stennis funding also do research, teach and/or do extension. Often some are involved in international programs. The combination of research and teaching is deemed as a necessary combination for faculty to effectively prepare their students to become stewards for our natural resource environment. The competitive grants give the outstanding faculty, judged by peers, an opportunity to pursue some of the very difficult environmental research and education issues society has singled out as priorities.

At our nation's universities and colleges, the combined McIntire-Stennis, RREA and competitive grants provide resources critical to pursuing research and informational needs related to atmospheric pollution, global warming, biological diversity, water quality, wildlife and timber management, agroforestry and forest protection.

I believe we would be remiss today, Mr. Chairman, if we did not also take this opportunity to express NAPFSC's disappointment at President Bush's recent budget request for fiscal year 1991 which calls for a cut of nearly 25% in funding for the McIntire-Stennis Cooperative Research Program from last year's level, and the zeroing out of the RREA program. For several years, the McIntire-Stennis program has been funded at $17.5 million and the RREA program has been funded at $2.765 million. The strongest support for these programs has come from the Senate Appropriations Committee where $25 million was approved for McIntire-Stennis in FY 1988, and $20 million in FY 1989. This year, I understand that the Cooperative State Research Service and the USDA recommended maintaining the current funding level for McIntire-Stennis but were overriden by OMB. I bring this to your attention, Senator Fowler, since you are also a member of the Agriculture Appropriations Subcommittee, and you, along with Senator Cochran and other supporters of forestry in the

Subcommittee have worked in past years to insure that adequate funds are provided for McIntire-Stennis and RREA.

We thank you for your past efforts on behalf of these critical programs and urge the Senate to once again for McIntire-Stennis and RREA.

Senator FOWLER. Thank you, Dr. Vogt. What minimal level of funding would you suggest is needed to meet the needs of McIntire-Stennis?

Dr. VOGT. Larry has the figure.

Dr. TOMBAUGH. The National Association of Professional Forestry Schools and Colleges working with the National Association of State University and Land-Grant Colleges has recommended this year the number $18.316 million for McIntire-Stennis. As an aside, last week I met with the National Forest Products Association research group, and I was interested and pleased that their policy group feels so strongly about this program that their recommendation will be $25 million this year.

Senator FOWLER. Well, we need all the recommendations and back up support. I appreciated Dr. Vogt's acknowledgement. It really was the Senate Appropriations Committee that saved it 2 years in a row. I did not know about that recommendation.

Dr. VOGT. I would add to the response that Larry gave in somewhat of a portrayal mode, the universities that utilize these funds utilize them in such a way as they support faculty programs, graduate student programs. They are developing research programs in McIntire-Stennis funding, and extension delivery programs in the others. We get very comfortable very quickly with programs that are normally 3 to 5 years in duration for completion when we have an increase like this.

So it will be very difficult for schools to not stay at least at the level we had last year plus the inflationary increases that Dr. Tombaugh mentioned. Of course, we would be delighted to have the full support of the recommendation, but I would say that we go on record as wanting to have our level of last year protected and increased slightly.

Senator FOWLER. Tell me this, both of you. Are we maintaining high levels of applicants at our forestry schools?

Dr. TOMBAUGH. The enrollment in forestry took a tremendous dip after the huge wave of interest following the environmental interest in the 1970's. And a lot of us, many of us, are concerned right now that we have gone too far the other way. That with the retirement coming on in the Forest Service, and the needs of industry, that we have too few students in forest schools. The applicants are picking up. Enrollments around most forestry schools is increasing. Whether it is going to increase fast enough to meet the demands is an open question.

Senator FOWLER. Well, that is something else we ought to look at in the America the Beautiful program, it seems to me. What kind of classes are they asking for? I mean are they asking for more and more on wildlife management, water quality, trade? Is there a change in the curriculum that has anticipated that demand or reacted to it?

Dr. VOGT. Yes, sir. The forestry program has undergone an evolution and a revolution, if you will, in the past 10 years in this country. We are now, most of us, not forestry schools but we are schools of natural resources or schools of forestry and fisheries and wildlife, or schools of forestry, fisheries and wildlife and recreation. In other words, the natural resource management educational need has now surfaced, and our forestry curricula that produce forestry majors will include common courses at the level of understanding natural resources policy, understanding measurements of the natural resources, and the environment and a capstone team working kind of management approach. So that our students that come out of these programs now are much broader in the way of natural resources management than they were 10 or 15 years ago. This is taking place with regularity because it is an absolute need, as reflected in the contents of the Renewable Resources Extension Act, that deals with forestry and its related kinds of activities and the McIntire-Stennis Act which does the same.

So, yes, the education is much broader. There is more emphasis on communication skills than there ever has been, computer science and some of the technical advancements. Larry, anything to add to that?

Senator FOWLER. Well, I was just thinking of both of your testimony in relationship to what we heard this morning. If we are going to have this, what does the administration call it, Earth Corps? How are they are going to recruit all these kids to plant so many of these trees? Dr. Tombaugh asking in his specifics for more graduate and undergraduate fellowships especially to include minorities and women in our forestry program, seems like we are about to develop a whole cadre that may be wanting to come to school after they serve a year or two in this program. At least, it seems like that would be a natural progression and one that we could tap.

You mentioned the peak enrollment was in the 1970's. I am not arguing with you. It seems to me we have so much more concern about the environment now and in the next 10 years than we had 10 or 15 years ago.

Dr. TOMBAUGH. And we are beginning to see that reflected, Senator Fowler, in enrollment. There is no two ways about it.

Senator FOWLER. I hope we, again, in putting together our bill and our new programs, I keep reflecting, 1 billion trees is a lot of trees. A lot of planters are going to be out there, and we are going to have a lot of people interested in forestry, and we have a chance, I think, to really elevate it to the level that I feel we need.

Dr. VOGT. Some of the existing programs that are supported by RREA include 4-H and vocational agriculture. Young people that oriented toward those activities could be drawn into them and could ultimately go to college and study that area. Many of them do. Enrichment of some of those programs, enhancement might be a way to approach this.

Senator FOWLER. Well, gentlemen, thank you so very much.

Dr. TOMBAUGH. Thank you, sir.

Senator FOWLER. I look forward to working with you as we go forward.

Dr. VOGT. Thank you very much.

Senator FOWLER. Next panel is Mr. C.W. Moody, Alabama State Forester from Montgomery; Mr. James E. Neal, Southern Extension forester from the University of Georgia in Athens; and Mr. R. Neil Sampson, the executive vice president of the American Forestry Association. Welcome, gentlemen, and also again my thanks for your patience. Mr. Moody, would you like to go first?

STATEMENT OF C.W. MOODY, ALABAMA STATE FORESTER, NATIONAL ASSOCIATION OF STATE FORESTERS, MONTGOMERY, AL

Mr. MOODY. Yes, sir, I would, Mr. Chairman. Thank you very much for the privilege of visiting with you just a few minutes on this most important matter.

INTRODUCTION

I am Bill Moody, and I am the State Forester of Alabama. I am very pleased to be here today representing the National Association of State Foresters (NASF).

I begin by expressing my most sincere appreciation to this committee for continuing to rescue State and private forestry over the years as well because without your continued support, we probably would not have such a program to deliver these services. So thank you so much for that.

You invited me here today to discuss specific elements including forest stewardship which may be included in a forestry title in the 1990 farm bill, and I have to tell you, Mr. Chairman, that is one of my favorite topics.

Senator FOWLER. Were you here this morning? I tried to put in a plug for your program specifically.

Mr. MOODY. You did, and I really felt good about it.

Senator FOWLER. I did not know whether they were paying attention or not.

Mr. MOODY. In fact, I might say a few more words about that program in just a minute, Mr. Chairman.

FORESTRY TITLE IS A GREAT IDEA

Let me say that I think the forestry title is a great idea, an idea whose time has come, and it begins to acknowledge as you pointed out repeatedly today that forestry is a very important matter in the national agenda. And so I think that we have needed, long needed, a national forest policy toward private forest land. We have had one on the national forest, but we have long needed some direction in this area and I think the beginning of that direction can be evolved in the writing of this farm bill. And so I certainly look forward for the National Association of State Foresters of participating in that.

We believe, Mr. Chairman, that a comprehensive forestry title should address the following concerns: forest stewardship, forest protection, urban and community forestry, rural development and environmental education. I have attached to my testimony a proposal from NASF for a forestry title for your review (see attachment A, pp. 332 to 356).

FOREST STEWARDSHIP—TREASURE FOREST PROGRAM

Most of my remaining comments might be addressed to forest stewardship, Mr. Chairman. If I might depart now from this prepared document and talk to you just a little bit about the TREASURE Forest program which has been in place for about 16 years in Alabama, and thanks for mentioning that this morning. But today in Alabama, there are 2 million acres of forest land that are enhancing game habitat, that are producing timber, that are protecting water quality, that are otherwise enhancing our environment.

This TREASURE Forest program is a program of government agencies whose programs impact on the private nonindustrial landowner. They include the Alabama Department of Conservation, Alabama Cooperative Extension Service, Alabama State Forestry Commission, the ASCS, the Soil Conservation Service, and several other government agencies. Now the owners of this 2 million acres that have been certified as TREASURE Forest are doing this voluntarily. They are achieving their own objectives in a voluntary way so as to, as good stewards, to protect and enhance the other values that accrue to society's benefit from those lands.

Forestry, wildlife, conservation, and environmental communities in Alabama are in support of the TREASURE Forest program. The Alabama Forest Planning Committee, which as I mentioned, are the Government agencies, whose programs impact on the private nonindustrial landowner are the certifying agencies. We certify it and then reinspect and recertify every 5 years.

THE FOREST STEWARDSHIP PROGRAM

As you mentioned, the Forest Stewardship Program is kind of an evolution of the TREASURE Forest program from Alabama. So the NASF proposal with regard to forest stewardship is that we would like to recommend that we develop a program to place 25 million acres of nonindustrial privately owned forest land under stewardship management over a 5 year period.

The objective of this program would be to develop a forest resource base on nonindustrial private lands which would sustain economic stability as well as environmental quality. We believe we can do this by providing assistance to landowners for management of all forest resources with special emphasis on water, wildlife, recreation and timber. The stewardship program is intended to coordinate, improve, and more efficiently provide comprehensive resource assistance to private landowners, to provide private forest landowners with resource management objectives, to increase timber productivity and reforestation efforts by reaching a large number of private landowners, improve wildlife habitat, water and air quality and increase outdoor recreational opportunities, result in the improved harvesting practices and assure adequate regeneration of harvested stand.

It does provide, as the chairman has questioned several times today, does provide for a planned management of this tremendous forest resource, and I would have to feel, Mr. Chairman, that the stewardship program is not adequately represented in the President's recommendation for America the Beautiful trees program. I applaud the president's recommendation of that, but I must say that I do not see stewardship represented in there or protected in there. I might also say, Mr. Chairman, that you mentioned that the State Foresters have been working with the other agencies and private interests in the States and have a plan, and we have seen a great interest in Alabama in the ability to get together and some of the funds kind of pass through to the conservation department for a game biologist. And it becomes the glue that brings this thing together and makes it work more effectively.

Now we have worked already in a cooperative way, but I see this as a great opportunity to greatly accelerate this activity which one of the things that we protect in the South is the right to own land and pursue personal objectives on that land without regulation, and so this is a working together with the landowner to achieve national objectives.

FOREST PROTECTION

One other area, Mr. Chairman, that I wish to mention at this time with connection with the forestry title is forest protection. Often the importance of forest management which overlooks protection from fire and insect is not good business. Yet funding has been inadequate to meet forest protection needs especially in the face of growing urban/rural interface area and we have heard of all the fire problems in the West, and so we have a proposal in here, Mr. Chairman, that integrates volunteer fire department, State forestry agencies and the U.S. Forest Service together to be more effective on a local mutual aid basis as well as available on a national mobilization scale.

THE FOREST STEWARDSHIP PROGRAM AND MOST OF THE OTHER PROGRAMS WITHIN A FORESTRY TITLE SHOULD BE DELIVERED THROUGH THE STATE AND PRIVATE FORESTRY PROGRAMS OF THE U.S. FOREST SERVICE

Finally, Mr. Chairman, the forest stewardship program and most of the other programs within a forestry title should be delivered through the State and Private Forestry programs of the U.S. Forest Service. We have been here for what, 30 years, associated with State and private forests, and for the past 15 years we have seen administrations and budget directors trying to do away with State and private forests. I believe it is a model program of working between the Federal Government and the States and the local communities and the landowners. And it is a way we should be going in the Nation as far as approaching our forest land management business.

So the payoff associated with Federal and State programs that reach NIPF landowners is very substantial. Technical assistance is a very key program here and one that we have worked together with the Federal Government over the years, the U.S. Forest Service. Mr. Chairman, unfortunately, these programs are not large enough to meet the need, and we need to consider aggressively increasing and enhancing those. We have never really tried those on the scale that we ought to be trying them to get the job done.

CONCLUSION

In conclusion, while we have made considerable progress in improving our Nation's forest resources, a major part of which is a result of State and Private Forestry programs, much remains to be done.

In this age when global warming is becoming more of a concern, our Nation's waters are of critical concern, forest based recreation is increasingly important to our citizens, our balance of trade is out of kilter in the United States, and the world needs more fully productive, vigorous forests. Thank you, Mr. Chairman.

[The prepared statement, attachments A–D, and letter dated March 7, 1990, of Mr. Moody follow:]

The National Association of State Foresters

STATEMENT BEFORE THE SENATE AGRICULTURE SUBCOMMITTEE ON FORESTRY AND CONSERVATION

C.W. Moody, Alabama State Forester
National Association of State Foresters

March 1, 1990

Mr. Chairman, members of the Committee, my name is Bill Moody, and I am the State Forester of Alabama. I am very pleased to be here today representing the National Association of State Foresters (NASF). The State Foresters are the directors of the fifty state forestry agencies. Collectively, we assist in protecting, servicing and managing 57 percent of the nation's commercial forest lands.

You invited me here today to discuss specific elements, including forest stewardship , which may be included within a forestry title in the 1990 Farm Bill. Mr. Chairman, I have to tell you up front that Forest Stewardship is one of my favorite subjects.

Let me begin by saying that I think establishing a Forestry Title is a great idea. Our public and private forests provide many valuable resources to the nation. They are just as important as our other agricultural resources such as wheat, corn, peanuts and dairy products. Much attention has been given to national forest policy and management in recent years. I strongly believe it would serve the nation's interests to establish a national and comprehensive policy concerning the future management of our private forest lands. And that is what can be done by writing a forestry title for the 1990 Farm Bill.

The National Association of State Foresters believes that a comprehensive Forestry Title should address the following concerns: Forest Stewardship, Forest Protection, Urban and Community Forestry, Rural Development, and Environmental Education. I have attached (Attachment A) to my testimony NASF's proposal for a Forestry Title for your review. Most of my discussion will concern itself with Forest Stewardship.

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The goal of forest stewardship as national policy should be to balance the production of commodity-oriented goods and services with other resource values from non-industrial private forest lands. The total picture should address timber management, wildlife management, soil, water and air management as well as recreational and other scenic qualities.

On the national level, approximately 57 percent of our nation's commercial forest land (225 million acres) is privately owned by nearly 8 million non-industrial landowners. These lands provide more than 40 percent of our current national wood supply. It is estimated that demand for timber products will increase by 45% over the next 50 years. Private lands hold great potential for meeting and sustaining the nation's future needs for timber and many other natural resources. I say potential, because many of these lands need to be better managed and they need to be managed for more than just their timber resources.

For example, we estimate that fewer than 30 percent of the landowners harvesting timber today are following a professional resource management plan. A recent survey showed that 38 percent of Alabama landowners did not know who to call for forest resource management assistance. Many private landowners do not realize that they can manage for timber production and at the same time enhance other resources, including wildlife habitat, air and water quality, soil conservation and recreation.

Alabama is blessed with over 23.6 million acres of productive forestlands. Nearly all of this land (95 percent) is privately owned. Non-industrial private forest (NIPF) land owners control 75 percent of Alabama's forestland. Alabama has been planting trees for over 60 years, including over 200 million trees planted in 1989.

However, we are still well below our potential. We estimate that forests in Alabama are growing timber at only 50 percent of their potential, compared to fully productive natural forests. Many lands are not regenerated adequately, and unfortunately, many lands are still neglected.

How private forest lands are managed today and in the future will determine the availability and quality of these forest resources. In turn, the management of these lands depends upon the availability of professional resource management assistance that incorporates the full range of environmental, social and economic concerns. This is what a forestry title and more specifically the Forest Stewardship Program can and should address.

Mr. Chairman, I believe we already have the foundation for such a policy in a new national program that is just getting underway. This is the Forest Stewardship Program, which was first proposed by State Foresters and was funded by Congress last year. I would like to note that this program is modeled after one we established in Alabama 16 years ago called

TREASURE Forest. This program is extremely successful. TREASURE Forest is accepted by all sectors of the forestry, wildlife, conservation and environmental communities. The increased interest in good forest management brought about by TREASURE Forest has helped foresters "sell" the need for reforestation. We meet the landowner at his/her point of interest and promote optimization of resource values from that point.

The initial reports from the 1990 Alabama Forest Survey indicate that the number of pine plantations in West Alabama has roughly doubled. More importantly, most of these new plantations have been established by NIPF land owners. TREASURE Forest and Forest Stewardship are providing a dynamic way to encourage landowners to better manage their precious natural resources.

I believe these programs can provide the foundation for Stewardship in a Forestry Title.

Forest Stewardship

The goal of our Stewardship program is to place 25 million acres of non-industrial privately-owned forestland under stewardship management over a five-year period. Its objective is to develop a forest resource base on nonindustrial private lands which will sustain economic stability, as well as environmental quality.

We believe we can do this by providing assistance to landowners for management of all forest resources, with special emphasis on water, wildlife, recreation and timber. The Stewardship Program is intended to:

- coordinate, improve and more efficiently provide comprehensive resource assistance to private forest landowners.
- provide private forest landowners with resource management objectives.
- increase timber productivity and reforestation efforts by reaching a larger number of private landowners.
- improve wildlife habitat, water and air quality and increase outdoor recreational opportunities.
- result in improved harvesting practices and assure adequate regeneration of harvested stands.

Funds appropriated by Congress will be matched by the states. The major responsibility for implementing the program lies with state forestry agencies. However, state plans are being formulated and developed in consultation with state and federal agencies and other interest groups.

With the money Congress appropriated, the State Foresters set the following goals to meet this year:

1. Assemble a multiagency stewardship committee in each state, to coordinate the delivery of professional service to the landowners.

2. Prepare a state-level stewardship plan which includes:
    - the five-year program
    - strategy for matching federal funds
    - targeted acreage over five years
    - implementation strategy
    - five year budget

3. Document program accomplishments including specifics on stewardship and the number of landowner plans prepared.

As mentioned earlier, in Alabama, the Forest Stewardship Program began 16 years ago. Our version, called TREASURE Forest, is designed to educate and guide forest landowners by providing coordinated assistance from the many varied resource professions with an interest in multiple use management. A multiple resource, multiple use management plan is prepared for them outlining a course of action which addresses timber, wildlife, soil and water quality, recreation, aesthetics and environmental quality. We recognize landowners for their accomplishments and encourage them to post a specifically designed sign marking their forests as TREASURE Forests.

Programs such as TREASURE Forest and Forest Stewardship provide solutions for the future. As the public demands more and more non-consumptive resources from the national forests, we can reduce our reliance on public lands for timber and other natural resources by increasing production on private lands. Our private forest lands, without question, offer the potential for fulfilling future timber demands. And this can be done without risk of sacrificing other resource values!

Another area that is important to consider while developing a forestry title is Forest Protection. Often the importance of total forest management, which includes protecting forests from fire and insects and disease is overlooked. Forest protection is vital for ensuring the health and survival of forests. Yet funding has been inadequate to meet all of the forest protection needs, especially in the face of growing urban/rural interface problems. Fire protection is a high priority issue for NASF and we are supporting legislation which emphasizes co-operation between state forestry agencies, volunteer fire departments and the USDA Forest Service. Attachment C is a brief overview of H.R. 3955, the "National Fire Forces Mobilization Act of 1990," introduced by Congressman Claude Harris of Alabama February 6, with the support of 108 cosponsors.

State and Private Forestry

The Forest Stewardship Program and probably most any other program included within a Forestry Title will be delivered through the U.S. Forest Service's State and Private Forestry (S&PF) programs. This has been the traditional means of providing vital technical and financial assistance for fire and pest protection, improved forest resource management, utilization, and planning on nonindustrial private forest lands.

The relationship between the state forestry agencies and the Forest Service is a model for achieving programs of national interest. The relationship in this model emphasizes cooperation and assistance rather than threats and regulation. It works and it is cost effective. I have been the State Forester of Alabama for over 17 years, and in that time the accomplishments resulting from the cooperative efforts between State Foresters and the U.S. Forest Service have been impressive.

Improved state forestry agencies have provided better protection of private forests from wildfires, insects, and disease. Our rural forests have been made more productive by this protection and by enhanced service to private forest land owners. Our cities forests are healthier as the result of this cooperative relationship.

These State and Private Forestry programs would not exist at this time were it not for the concern of this committee and the Congress. Presidents and budget directors, since the Carter administration, have recommended that State and Private Forestry funding in the U.S. Forest Service budget be drastically reduced or totally eliminated. You have retained these programs which have contributed so much to our nation's well-being.

The payoff associated with federal and state programs that reach NIPF owners is substantial. Technical assistance increases the probability of harvest and regeneration; and boosts stumpage prices and present value per acre of forest holdings. Moreover, public forestry assistance can pay off in the form of increased income tax revenue to public treasuries.

Unfortunately, these programs are not nearly large enough. Currently, the government is assisting timber owners on only one percent of the country's 333 million acres of private forest land. Federal and technical assistance programs are reaching less than 200,000 of the country's nearly eight million NIPF landowners.

In conclusion, while we have made considerable progress in improving our nation's forest resources, a major part of which is the result of State and Private Forestry programs, much remains to be done. In this age when global warming is becoming more of a concern, our nation's waters are of critical concern, forest based recreation is increasingly important to our citizens, our balance of trade is very much out of kilter, the United States and the world need fully productive, vigorous forests.

Attachment A - NASF proposed Forestry Title
Attachment B - Alabama Stewardship Plan
Attachment C - Outline of the "National Fire Forces Mobilization Act of 1990"
Attachment D - NASF Budget Recommendations

ATTACHMENT A

Draft Input Into The 1990 Farm Bill
A Forest Resource Management Title
by the
National Association of State Foresters
(February 24, 1990)

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References Used.. [illegible]

Draft Input Into The 1990 Farm Bill
National Association of State Foresters
(Executive Summary)

Title X. Forest Resources Management

SUBTITLE A. Forest Stewardship

Primary Goal. Achieve a balance in the production of commodity-oriented goods and services and amenity values from non-industry private forest lands.

Major Objectives. Timber management; wildlife management; recreation; scenic quality.

Key Output. 25,000,000 acres of non-industry private forest lands placed under forest stewardship.

Authorized Appropriation. $25,000,000 for each fiscal years 1991 through 1995.

SUBTITLE B. Conservation Program.

Primary Goal. Conserve the natural resources of the Nation's private, non-industry forest lands -- its soil, water, air, land base, and vegetative diversity -- to enhance the quality of life of the American people.

Major Objectives. Soil conservation; water quality and quantity; air quality; land base protection (including grazing and wetlands); biological diversity; global climate change.

Key Output. 55 million acres in the Conservation Reserve Program -- 10 million acres of tree planting.

Authorized Appropriation. $300,000,000 for each fiscal years 1991 through 1995.

SUBTITLE C. Urban and Community Forestry.

Primary Goal. Mutiple-use management of the forest resource in urban and community areas.

Major Objectives. Public awareness; multiple-use management.

Key Output. Improved quality of life in urban settings.

Authorized Appropriation. $70,000,000 for each fiscal year 1991 through 1995.

SUBTITLE D. Rural Revitalization Through Forestry.

Primary Goal. Diversify the economic base of rural america through a balanced use of the forest resource.

Major Objectives. Training; baseline information; business plans; income producing opportunities; marketing strategies; applied research; technical assistance.

Key Output. Improved economic stability.

Authorized Appropriation. $10,000,000 in fiscal year 1991, and $40,000,000 in each fiscal years 1992 through 1995.

SUBTITLE E. Forest Protection.

Primary Goal. Protect the Nation's private, non-industry forest lands through fire forces mobilization and forest health monitoring.

Major Objectives. Fire forces mobilization; forest health monitoring.

Key Output. Protection of forest resources and rural communities.

Authorized Appropriation. $120,000,000 for each fiscal year 1991 through 1995.

SUBTITLE F. Environmental Education.

Primary Goal. Educate to ensure the wise use and maintenance of the Nation's private, non-industry forest resources.

Major Objectives. Conservation education; technology adoption; environmental awareness; applied research and demonstration.

Key Output. Improved conservation and land management ethic.

Authorized Appropriation. $20,000,000 in fiscal years 1991 through 1995.

Authorization Appropriation Summary. The following summarizes the authorized appropriations for the National Association of State Foresters proposal for the 1990 Farm Bill:

Subtitle	1991	1992	1993	1994	1995	Total
			...Dollars in millions...			
Stewardship	$ 25	$ 25	$ 25	$ 25	$ 25	$ 125
Conservation	300	300	300	300	300	1500
Urban Forestry	70	70	70	70	70	350
Revitalization	10	40	40	40	40	170
Protection	120	120	120	120	120	600
Education	20	20	20	20	20	100
Totals	$545	$575	$575	$575	$575	$2845

Draft Input Into The 1990 Farm Bill
National Association of State Foresters
(Activity Index)

Issues	A	B	C	D	E	F
	...Subtitles...					
Agroforestry		X				
Air quality	X	X			X	
America the beautiful	X	X	X			X
Applied research						X
Biological diversity	X	X				
Conservation education			X			X
Conservation Reserve Program	X	X				
Economic diversity				X		
Energy conservation		X	X			
Environmental awareness			X			X
Environmentally sensitive lands		X				
Fire forces mobilization					X	
Forest health					X	
Global climate change	X	X				
Information management	X	X	X	X	X	X
Land inventory		X				
Living snowfences	X	X				
Loan fund				X		
Marginal croplands		X				
Multiple-use management	X	X	X			
Pasturelands		X				
Recreation	X	X	X			
Riparian lands		X				
Rural revitalization				X		
Scenic quality	X		X			
Soil Conservation	X	X				X
Soil loss tolerance		X				
Shelterbelts	X	X				
State Resources Planning	X	X	X	X	X	X
Technology adoption						X
Technology transfer	X	X	X	X	X	X
Timber management	X	X		X		
Tree planting	X	X	X			
Urban and Community Forestry			X			X
Water quality	X	X				
Water quantity		X				
Wetlands	X	X				
Wildlife management	X	X				
Windbreaks	X	X				
Wood products marketing	X	X		X		
Woody filter strips	X	X				

Subtitle A.	Forest Stewardship
Subtitle B.	Conservation Program
Subtitle C.	Urban and Community Forestry
Subtitle D.	Rural Revitalization Through Forestry
Subtitle E.	Forest Protection
Subtitle F.	Environmental Education

1990 FARM BILL

TITLE X--FOREST RESOURCES MANAGEMENT

SUBTITLE A--FOREST STEWARDSHIP

FINDINGS AND PURPOSE

Section 1 - Congress finds and declares that:

(1) Nearly three-fourths of the commercial forest land in the United States is in private ownership, and most of this land is held by about 8,000,000 non-industry private forest landowners.

(2) Increasing demands are being placed on non-industry private forest lands to provide a wide variety of products and services including fish and wildlife habitat, maintenance of wetlands, aesthetics, and recreational opportunities.

(3) Nearly one-half of the nation's wood supply comes from non-industry owned lands and this percentage will increase in the future. How these lands are harvested, will impact the quality of life, the vitality of forest resource related industries, and the economic base of local rural economies. Studies and projections of wood products supply and demand indicate that a shortage will occur in future years.

(4) Global warming is a threat to our existence but can be reduced by forest cover. Furthermore, stewardship of non-industry private forest lands keeps these lands in a productive and healthy condition that contributes to our overall quality of life and helps mitigate global climate changes.

(5) Diverse ecological areas such as wetlands are declining but can be protected through responsible land management.

(6) The Nation's water and air quality and fish and wildlife habitats are declining. The quality of the Nation's water and air and the quality of forested wetlands and other habitats available for threatened and endangered species of fish and wildlife can be maintained and improved through good stewardship of non-industry private forest lands.

(7) Forest stewardship management on these lands will improve soil productivity, water and air quality, fish and wildlife habitats, quality outdoor recreation and a continuous supply of forest products.

(8) The products and services resulting from non-industry private forest land stewardship provide income and employment that contributes to the economic health and diversity of rural communities.

(9) Stewardship of non-industry private forest lands requires a long-term commitment by the owners of these lands, and such a commitment can be fostered through State and Federal governmental actions and assistance; and

(10) The United States Department of Agriculture, through the Forest Service and other cooperating agencies, has expertise and experience that can help the owners of non-industry private forest lands achieve their goals while, at the same time, provide significant public benefits.

Purpose - It is the Purpose of this section to provide assistance to forest landowners in order to maximize the production of commodity and non-commodity goods and services from state and private lands.

FOREST STEWARDSHIP TECHNICAL ASSISTANCE

Section 2 - In carrying out the Forest Stewardship Program, the Secretary, through the auspices of each State Forester or equivalent State official, is authorized to establish a Forest Stewardship Assistance Program (hereinafter in the section referred to as the "Program") to encourage the long-term stewardship of non-industry private forest lands by assisting owners of these lands to more actively manage their forest and related resources.

(1) The goal of the Program shall be to place 25,000,000 acres of non-industry private forest lands under stewardship management between 1991 and 1995.

(2) In carrying out the Program, the Secretary, through the auspices of each State Forester or equivalent official, is authorized to provide financial assistance to other State and local natural resource agencies and land grant universities for the delivery of information and professional assistance to owners of non-industry private forest lands.

(3) The Secretary, through the auspices of each State Foresters or equivalent State official, is also authorized to cooperate directly with other State and local natural resource agencies and land grant universities in implementing this section in those cases where the State Foresters or equivalent State officials are not able to make fund transfers to other agencies. Such information and assistance shall be directed to help the owners of these lands understand and evaluate alternative actions they could take to:

(a) protect, maintain, and enhance fish and wildlife, soil, water, air, wetlands recreation, and timber resources;

(b) invest at least a portion of the proceeds from the sale of timber or other forest products and services in stewardship practices that would protect, maintain, and enhance the resources identified in paragraph (a);

(c) ensure that forest regeneration or reforestation occurs where needed to sustain long-term resource productivity and to help prevent major climatic changes as a result of the greenhouse effect; and

(d) protect their forest from damage caused by fire, insects, or diseases.

(4) The Secretary, through the auspices of each State Foresters or equivalent State official, is encouraged to develop an appropriate recognition program for landowners who practice stewardship management on their lands, with an appropriate, special recognition symbol and title.

(5) There are hereby authorized to be appropriated $25,000,000 for each of the fiscal years 1991 through 1995 to implement this section.

FOREST STEWARDSHIP RESERVES

Section 3 - The Secretary will carry out a Stewardship Reserve Program that will enter into long-term contracts with owners and operators and assist them to establish tree cover, shelter belts and other woody filter strips on highly erodible cropland, pasture land, wetlands, and riparian areas to conserve and improve the multiple forest resource benefits of their farms and ranches.

COST-SHARING PARTNERSHIPS

Section 4 - In return for a contract entered into by an owner or operator under Section 3, the Secretary shall:

(1) Provide a one time lump sum payment to landowners and operators based upon a 5-year contract. The payment will not exceed $50 per acre or $50,000 for any one owner or operator.

(2) Eligibility criteria for lump sum payments will be prepared by the secretary for highly eroding croplands, pasture lands, wetlands, and riparian areas that will support tree growth.

(3) Share the cost of carrying out the stewardship measures and practices set forth in the contract for which the Secretary determines that cost sharing is appropriate and in the public interest. These practices will include but not be limited to:

(a) establishing timber and wildlife cover;

(b) restoring or enhancing wetlands and riparian areas with forest cover.

(4) The federal share of establishing stewardship measures and practices shall not exceed 75 percent of the total cost. Total payment to any one landowner for establishing the measures or practices shall not exceed $75,000.

(5) Existing mechanisms will be used to the extent possible by the Secretary to make payments and deliver services to landowners.

(6) Amends Section 4 of the Cooperative Forestry Assistance Act to require an approved forest management plan before timber harvest to qualify for Forestry Incentives Program Cost Share funding after fiscal year 1992.

DUTIES OF OWNERS AND OPERATORS

Section 5 - Under the terms of a 5-year contract, an owner or operator of a farm, ranch or forest must agree:

(1) To have a management plan prepared and approved which as a minimum covers the life of the contract. The plan must include considerations for fish and wildlife habitat, water, recreation, and timber.

(2) Convert eroding cropland, pasture land, wetlands, and riparian land use to tree cover or wildlife habitat.

(3) Not to use such land for agricultural purposes to conduct harvesting (crops), grazing or commercial use of such land during the life of the contract. Hunting, fishing, and recreation leases would be exempt from this requirement.

AUTHORIZATION OF APPROPRIATIONS

Section 6 - During each of the fiscal years 1991 through 1995, the Secretary shall use the facilities, services, authorities, and funds of the Commodity Credit Corporation to provide the one time lump sum payment and cost share payments to implement Section 3. Total payments for the 5 fiscal years will not exceed $500,000,000.

Funding to administer Section 3 shall not exceed 15 percent of the total cost.

FOREST STEWARDSHIP TAX INCENTIVES

Section 7 - A qualifying taxpayer who is certified under the Stewardship Program shall be treated as materially participating in timber activity under subsection (h) of section 469 of the Internal Revenue Code of 1986.

Section 8 - Estates managed under the Stewardship Program will be exempted from inheritance taxes on the first $750,000 of the estate's value.

Section 9 - The maximum estate tax rate shall be 50 percent on estates certified under the Stewardship Program.

SUBTITLE B--CONSERVATION PROGRAM

PURPOSE AND FINDINGS

Section 1 - Congress finds and declares that:

(1) Over one-half of the Nation's forest lands are in need of some type of conservation treatment; site productivity losses due to excessive soil erosion pose significant economic losses to society.

(2) About 800,000 acres of rural land are lost each year to urban development; less than one-half of the country's original acres of wetlands remain; over 80 percent of the wetland losses nationwide are the result of agricultural drainage or land clearing.

(3) The demand for commodity and non-commodity goods and services from the Nation's forest lands will continue to increase. Domestic and international demands for food, fiber, and a quality environment which encompasses open space, natural areas, wildlife habitat, and clean air and water, will generate intense pressures on the Nation's forest resources.

(4) The quality of the Nation's soil, water, and air resource and the quality and quantity of wetlands and other habitat for threatened and endangered plant and animal species can be maintained and improved through sound conservation programs; conservation programs do much to solve environmental problems.

(5) Trees are a significant factor in implementing conservation programs. Trees provide environmental, social, and economic benefits. They enhance biodiversity, wildlife, air and water quality, and recreational opportunities. They help reduce soil erosion and provide future supplies of timber and wood products. Trees are especially effective natural air cleaners by removing carbon dioxide from the atmosphere and releasing oxygen.

(6) The United States Department of Agriculture, through the Forest Service and other cooperating agencies, has the expertise and experience to assist state and local governments in the conservation of their forest and range resources.

Purpose - It is the purpose of this section to provide assistance to state and local officials in the conservation of their forest and range resources to protect the environment while maintaining a balanced supply of goods and services from these forest and range resources.

CONSERVATION PROGRAM GOALS AND OBJECTIVES

Section 2 - The following goals will be addressed under this subtitle:

(1) **Soil Conservation** - Minimize the adverse effects of soil erosion on the Nation's soil and water resources in order to sustain their long-term integrity and productivity.

(2) **Water Quality** - Manage forest lands in a manner that supports the attainment of National surface and ground water goals, as established by the Clean Water Act, as amended, and the Safe Drinking Water Act, as amended, and specifically the achievement of water quality standards.

(3) **Water Quantity** - Sustain the supply of water, both ground and surface, to meet long-term, multiple use needs of society.

(4) **Air Quality** - Reduce air transportation and deposition of contaminants involving soil particles and toxic chemicals.

(5) **Marginal and Environmentally Sensitive Lands** - Protect environmentally sensitive lands, including marginal grazing lands, while providing for sustained productivity.

(6) **Wetlands** - Protect, maintain and restore wetland habitat and achieve a "no net loss of wetlands" through management of agriculture and forest lands.

(7) **Biological Diversity** - Provide a sustainable diversity of plant and animal species to ensure a strong genetic pool of natural resources to benefit current and future generations.

(8) **Global Climate Change** - Manage and enhance forest lands to reduce the adverse impacts of global climate change.

Objectives - The following objectives address each of the goals outlined in the above Section (a). This includes a continuance of the Conservation Reserve Program, targeting 10 million acres of marginal cropland, pasture land and harvested areas for tree planting and other permanent vegetative cover:

(1) Soil Conservation:

(a) ensure that the highly erodible land planted to trees in the Conservation Reserve Program continues to be adequately protected after the initial contract period;

(b) provide additional incentives to attract private landowners to plant trees to retire more acres of erodible cultivated cropland. Expand the Conservation Reserve Program to 55 million acres;

(c) coordinate the objectives of the Conservation Reserve Program, the Forest Stewardship Program (Subtitle A, Forest Resources Management Title, 1990 Farm Bill), and the "America the Beautiful" program (rural tree planting component);

(d) develop sustainable agriculture production systems that incorporate trees and shrubs;

(e) using the Northern Lands Study as a principle, inventory and study lands to determine the best and highest-value use.

(2) Water Quality:

(a) identify and implement the best management practices that will achieve water quality standards;

(b) focus resources in areas identified in the State Forest Resources Plan that most efficiently address water quality issues;

(3) Water Quantity:

(a) incorporate minimum instream flow requirements in forest resources planning;

(b) protect critical ground water recharge areas;

(c) improve institutional and administrative abilities to manage water surpluses and shortages;

(4) Air Quality:

(a) encourage the establishment of windbreaks and shelter belts;

(b) encourage tree planting on retired erodible cultivated cropland;

(c) expand tree planting for energy plantations to replace fossil fuels;

(d) encourage the adoption of efficient fertilization practices to minimize off site damages;

(5) Marginal and Environmentally Sensitive Lands:

(a) place in permanent vegetative cover through tree planting, not less than 10 million acres of highly erodible, marginal lands including 4 million acres of pasture land by 1995. This will be accomplished through cost sharing, rental payments, other financial or economic measures, long-term contracts for bottomland hardwood sites and continuous sign-ups.

(6) Wetlands:

(a) re-establish and restore 3 million acres of wetlands over the next five years.

(7) Biological Diversity:

(a) improve the awareness of landowners about biological diversity and particularly the value of a diverse habitat for wildlife;

(b) assist landowners in developing management plans for protecting, regenerating, and improving biological diversity and its associated improvements in plant and animal habitats;

(c) encourage that all plantings achieve a proper vegetative mix to ensure a diverse biological habitat;

(d) provide enhanced cost-sharing for maintaining native vegetation.

(8) Global Climate Change:

(a) encourage tree planting on marginal crop and pasture land;

(b) encourage tree planting of harvested areas. Target 1 million acres for tree planting;

(c) encourage efforts to increase tree planting for energy conservation purposes. This objective should be tied to the "America the Beautiful" initiative, both the rural and community tree planting programs;

(d) encourage the use of renewable energy sources as alternatives to fossil fuel sources.

PROGRAMS

Section 3 - The objectives under Section 2 (b) can be implemented most effectively through the guidelines of The Food Security Act of 1985, the Conservation Reserve Program, as amended.

Amendments - The Food Security Act of 1985 should be amended to enhance the effectiveness of the Conservation Reserve Program as follows:

(1) Protect the producer's crop base beyond the end of the contract period so long as the producer continues to leave the land in a protective cover of grass or trees; extend contract period to 15 years.

(2) For future contracts, require the land enrolled in the Conservation Reserve Program to meet soil loss tolerance levels ("T-value") if returned to cropping at the end of the contract period.

(3) Allow for windbreaks, shelter belts and woody filter strips into the Conservation Reserve Program without requiring enrollment of the entire field in question.

(4) Authorize third party person (s) (for example, Conservation Districts) to establish and maintain windbreaks and other conservation measures.

(5) Develop and authorize other amendments that promote reforestation and other conservation measures.

Other Programs - Other USDA programs that contribute to carrying out the objectives described in Section 2 (b) are authorized for implementation;

COST-SHARE PARTNERSHIPS

Section 4 - The Secretary of Agriculture shall make available cost-sharing partnerships through the Forest Service, State and Private Forestry to state and local governments to implement the conservation program objectives outlined in this Section.

Federal funds expended for each partnership will not exceed 80 percent of the total cost of the partnership. Non-federal contributions to each partnership may be in the form of cash services or equipment, as appropriate.

AUTHORIZATION AND APPROPRIATION

Section 5 - There are authorized to be Appropriated to carry out the provisions of this subtitle. $300,000,000 in each of the fiscal years 1991 through 1995. Annual allocations for the Conservation Reserve Program and other programs that contribute to carrying out the objectives described in Section 2 (b) will be determined through appropriate planning processes.

SUBTITLE C--URBAN AND COMMUNITY FORESTRY

FINDINGS AND PURPOSE

Section 1 - Congress finds and declares that:

(1) Conflicts between urbanization and existing natural resources at the fringe of urban areas are destroying the biological diversity and natural beauty of newly developed areas.

(2) Inadequate planning and improper development destroys the natural character of the land while creating serious human hazards from wildfire and flood as well as ground and surface water contamination.

(3) Shifting demographics and socio/economic needs are creating a demand for open space and recreational opportunities closer to home.

(4) Urban fringe communities that depend on farming and other natural resources from their economic base frequently experience conflict due to changing value systems between historic residents and new urban landowners.

(5) Remnant natural resources in developed urban areas, when properly managed, can add beauty, habitat for wildlife, increased recreational opportunities, improved property values, shade to reduce heat, clean air and protection from chilling winds.

(6) Natural resources are not given equal consideration with other socio/economic and infrastructure variables in the development and maintenance of urban environments.

(7) Natural resources when properly planned for and managed can provide for a safer, more environmentally and culturally diverse and more aesthetically pleasing lifestyle for urban residents.

(8) About 80 percent of the Nation's population live in urban areas. The demand to manage the forest resources in these urban and community areas is significant.

(9) The United States Department of Agriculture through the Forest Service and other cooperating agencies has expertise and experience to assist state and local agencies and municipalities with proper planning and management of natural resources in urban and developing urban areas.

Purpose - It is the purpose of this section to provide assistance to State and local officials with the identification, protection and management of natural resources in urban and developing areas in order to improve the quality of life for urban residents.

DEFINITIONS

Section 2 - Definitions as used in this subtitle:

(a) "Urban and Community Forestry" is the planning for the management of a community's forest resources to enhance the quality of life. The process integrates the economic, environmental, political, and social values of the community to develop a comprehensive management plan for the urban and community forest;

(b) a "community" is an area of human settlement ranging from rural to metropolitan regions;

(c) the "urban forest" includes the vegetation, open space, and related natural resources of the urban and community area.

GOALS AND OBJECTIVES

Section 3 - The following goals will be addressed under this subtitle:

(1) **Public Awareness** - Stimulate a resource conservation ethic within the urban community by promoting the benefits of urban forest resource planning and management.

(2) **Multiple-Use Management** - Encourage the multiple-use management of the urban and community forest to achieve a balance with land development development, social, environmental and political values.

Objectives - The following objectives address each of the goals outlined in the above Section (a):

(1) Public Awareness:

(a) inform decision makers about the benefits of urban and community forest resource planning and management;

(b) implement an urban and community forestry awareness program through existing educational systems to inform the Nation's students about urban forest management;

(c) develop and implement a network among practitioners and researchers to enhance communication about urban and community forestry;

(d) promote the establishment of state and local councils that can serve as advocacy groups for urban forestry issues. Emphasize those councils that are composed of individuals representing a diversity of interests and disciplines.

(2) Multiple-Use Management:

(a) promote partnership-sponsored projects that demonstrate the benefits of integrating forest resource values with community development planning. The projects should reflect regional differences and needs;

(b) help develop urban and community forestry programs that demonstrate a multiple-use approach to urban and community forest management.

PROGRAMS

Section 4 - The objectives under Section 3 (b) can be implemented most effectively through the Urban Forestry Assistance program, USDA Forest Service, State and Private Forestry. The authority is the Cooperative Forestry Assistance Act of 1978, P L. 95-313. Currently, the "Urban and Community Forestry Act of 1989 (HR 2144)" is being developed in Congress and may amend P.L. 95-313.

Other Programs - Other USDA programs that contribute to carrying out the objectives described in Section 3 (b) are authorized for implementation. This includes funds appropriated for the initiative, "America the Beautiful" -- the Community Tree program component.

COST-SHARING PARTNERSHIPS

Section 5 - The Secretary of Agriculture shall make available cost-sharing partnerships through the Forest Service, State and Private Forestry to counties, cities, towns or other political and non-political subdivisions to implement projects that demonstrate comprehensive management of natural resources in urban and community areas.

Federal funds expended for each partnership will not exceed 50 percent of the total cost of the partnership. Non-federal contributions to each partnership may be in the form of cash services or equipment as appropriate.

AUTHORIZATION AND APPROPRIATION

Section 6 - There are authorized to be appropriated to carry out the provisions of this subtitle, $70,000,000 in each of the fiscal years 1991 through 1995. Annual allocations for the programs that contribute to carrying out the objectives described in Section 3 (b) will be determined through appropriate planning processes.

SUBTITLE D--RURAL REVITALIZATION THROUGH FORESTRY

FINDINGS AND PURPOSE

Section 1 - Congress finds and declares that:

(1) The economic well-being of rural America is vital to overall national growth and prosperity.

(2) Many rural areas suffer from a lack of business diversity.

(3) The economies of many rural communities depend upon the goods and services which are derived from the nation's forests.

(4) The lack of economic diversity is particularly serious in communities which are dependent on resources from National Forests where land management decisions adversely affect the supply of those resources.

(5) The nation's non-Federal forest lands, through commodity and noncommodity goods and services, provide a significant opportunity to help diversify rural economies.

(6) The Forest Service has the technical expertise and resources that could help rural communities diversify their economic condition; and

(7) Technical assistance, training, education, and other assistance provided by the Forest Service could be targeted to provide immediate help to rural communities with the greatest need.

(8) In conclusion, there is now a good opportunity, through bold action, to revitalize rural America.

Purpose - It is the purpose of this section to provide assistance to rural communities to diversify and revitalize their economic condition by using the forest resources of all the nation's forest lands, including Federal, State, and private ownerships. This will ensure the economic, social, and environmental well-being of rural America.

DEFINITIONS

Section 2 - Definitions as used in this subtitle:

(a) "Rural communities" are towns and cities, or other governmental entities characterized by remote locations that are primarily dependent on farming, national resources, recreation or tourism for their economic base.

(b) "Economic development" refers to a fundamental and sustainable increase in the productivity of individuals and institutions, leading to improvements in per capita incomes of local citizens.

ISSUES

Section 3 - Rural revitalization through forestry allows the following four issues to be addressed:

(1) Economic development
(2) Economic competitiveness
(3) Environmental protection and enhancement
(4) Improved standard of living

Rural revitalization through forestry can be addressed through a more aggressive, but balanced, use of the forest resources. Through a balanced program of producing commodity and noncommodity goods and services, economic and environmental values can be maintained.

OBJECTIVES

Section 4 - The aforementioned issues can be addressed through six specific, yet interrelated objectives:

(1) Training
(2) Baseline information
(3) Business plan development
(4) Income maintenance and new financial capital
(5) Applied research
(6) Technical assistance

The Forest Service shall provide a wide range of technical assistance to work with state governments, rural communities, and others involved in rural revitalization to identify needs and opportunities whereby rural areas can optimize the use of surrounding forest resources to benefit their economy and improve living standards.

In addition to direct technical assistance, objectives will be achieved through specific projects proposed by rural communities and approved by the Forest Service.

Within 120 days after the date of enactment of this title, the Secretary of Agriculture shall develop specific regulations for the implementation of this subtitle. This will include an assessment of the current USDA programs to bring them into line with a clear rural revitalization strategy.

PROGRAMS

Section 5 - Objectives to ensure rural revitalization through forestry can be implemented through traditional Forest Service activities. These include:

(1) Wood products development and marketing
(2) Outdoor recreation
(3) Wildlife habitat improvement
(4) Urban Forestry
(5) Information management
(6) State forest resources planning

COST-SHARING PARTNERSHIPS

Section 6 - The Secretary of Agriculture shall make available cost-sharing partnerships through the Forest Service, State and Private Forestry, to rural communities and rural development entities (such as Resource Conservation and Development (RC&D) units) to implement projects that meet objectives designed to revitalize rural America.

Funded projects will, insofar as possible, be designed to maximize the use of the forest resources. That is, rural revitalization "through" forestry.

Federal funds expended for each partnership will not exceed 50 percent of the total cost of the partnership, except for monies associated with the loan fund. Non-federal contributions to each partnership may be in the form of cash, services, or equipment, as appropriate.

LOAN FUND

Section 7 - A loan fund is to be created in the Treasury and administered by the Secretary of Agriculture. The loan fund is intended to implement the "income maintenance and new financial capital" objective to ensure rural revitalization of America.

Monies held in the loan fund will be dispersed to rural communities through the Farmer's Home Administration, based on projects that are approved by the Forest Service.

Loan funds to rural communities will be used for the purpose of:

(1) Improving existing facilities
(2) Expanding existing facilities and services to capitalize on opportunities
(3) Supporting the development of new industries or businesses, and
(4) Supporting recycling and waste management projects

Loans made available shall be at a rate prescribed by the Secretary of Agriculture, but not in excess of 6 percent per annum.

AUTHORIZATION OF APPROPRIATIONS

Section 8 - There are authorized to be appropriated to carry out the provisions of this subtitle, $10,000,000 in fiscal year 1991, and $40,000,000 in each of the fiscal years 1992 through 1995. Fiscal years 1992 through 1995 include a $30,000,000 loan fund to implement the "income maintenance and new financial capital" objective. The $10,000,000 authorized for each of the fiscal years 1991 through 1995 will be used to implement the other objectives of rural revitalization of America. Amounts under this section shall remain available until expended.

SUBTITLE E -- FOREST PROTECTION

FINDINGS AND PURPOSE

Section 1 - Congress finds and declares that:

(1) Nearly three-fourths of the commercial forest land in the United States is held in private ownership.

(2) The nation's capacity to produce renewable forest resources depends on these non-industrial private forest lands.

(3) Nearly half of the nation's wood supply currently comes from non-industrial private forest lands and this percentage is expected to increase in the future.

(4) The protection of healthy forests on private, State, and Federal lands will ensure a continuation of maximum wood production.

(5) The protection of healthy forests are essential for fish and wildlife habitats, outdoor recreation opportunities, production of pure domestic water supplies, reducing the rate of global warming, and reduction in the amount of soil erosion.

(6) The protection of the nations forests is essential to the social, economic and environmental well-being of the nation, currently no comprehensive monitoring process is in effect which will allow rapid intervention in the event of significant outbreaks of forest pests.

(7) The Forest Service has the technical expertise to protect the Nation's Forests and to develop any necessary remedial measures to assure that the forest is maintained and improved.

Purpose - It is the purpose of this section to provide assistance for the protection of the Nation's forests through efficent levels of fire protection and monitoring of the forest's health.

DEFINITIONS

Section 2 - Definitions as used in this subtitle:

(a) "Forest health" means a condition where biotic and abiotic influences on the forest (i.e. insects, diseases, atmospheric deposition, silviculture treatments, and harvesting practices) do not threaten management objectives for a given forest unit now or in the future.

(b) "Mobilization" means any activity in which one fire fighting organization assists another which has requested assistance.

OBJECTIVES

Section 3 - The above purpose can be addressed through six objectives:

(1) **Monitoring** - Establish a monitoring system throughout the Nation's forests to determine detrimental changes or improvements that occur over a five-year period and report annually.

(2) **Research** - Initiate appropriate research in agencies of the Department of Agriculture, Land Grant Universities, or in State agencies to determine the courses of any changes detected in forest health and to develop appropriate intervention methods.

(3) **Testing** - Conduct case studies of pilot tests of research results before full-scale application in affected forests.

(4) **Demonstration** - Implement appropriate silvicultural or management techniques that may improve or protect the health of the nation's forests.

(5) **Technology Transfer** - Provide professional and technical assistance to State and private forest landowners or the various techniques available to maintain a healthy forest.

(6) **Fire Forces Mobilization** - Train, equip, and otherwise enable State and local firefighting forces to respond adequately to the need for area, regional and national mobilization.

PROGRAMS

Section 4 - Objectives to insure the health of the Nation's forests can be implemented through the following Forest Service programs:

(1) Forest Pest Management
(2) Forest Insect and Disease Research
(3) Rural Fire Prevention and Control
(4) Rural Community Fire Protection
(5) State Forest Resources Planning

COST-SHARING PARTNERSHIPS

Section 5 - The Secretary of Agriculture shall make available cost-sharing partnerships through the Forest Service, State and Private Forestry to States and other government entities to protect the Nation's forest lands.

Federal cost-share for each partnership will not exceed 50 percent of the project cost. The non-federal share can be in the form of cash, services, or equipment as appropriate.

AUTHORIZATION OF APPROPRIATIONS

Section 6 - There are authorized to be appropriated to carry out the provisions of this subtitle, $120,000,000 in each of the fiscal years 1992 through 1995. The distribution of these funds is $20,000,000 for the forest health monitoring system and $100,000,000 for the mobilization of fire forces.

Appropriations to implement this section may be allocated to Federal agencies having jurisdiction over lands held or owned by the United States in the amounts necessary to assess and monitor forest health conditions on Federal lands and non-Federal rural forestlands.

SUBTITLE F -- ENVIRONMENTAL EDUCATION

FINDINGS AND PURPOSE

Section 1 - Congress finds and declares that:

(1) The production of food, fiber, and industrial products, basic human sustenance, and viable export markets all depend on sustainable productive renewable natural resources.

(2) Sustained outputs from the Nation's natural resources depend on well managed forest lands.

(3) Expanded education programs are essential to the wise use and insured sustainability of the Nation's natural resources on private, non-idustry lands.

(4) A balance mix of education, technical and financial assistance will help endure that the Nation's private, non-industry lands are properly stewarded.

(5) The Forest Service and Extension Service and other agencies in the Department of Agriculture have the technical expertise to educate forest landowners, and state and local entities about the importance of their forest resources and the contribution these resources can make to the well-being of the Nation's society.

Purpose - It is the purpose of this section to provide assistance for education programs that lead to the proper management and use of the Nation's natural resources on private, non-industry forest lands.

OBJECTIVES

Section 2 - The above purpose can be addressed through the following objectives:

(1) General Conservation Education - Educate landowners about goods and services that can be produced from a sustained forest resource base.

(2) Technology Transfer and Adoption - Train federal and state agency natural resource staffs in the sociological principles of forest resources technology adoption and application. Inform and educate owners and operators about the latest forest resource technologies and techniques.

(3) Environmental Awareness - Target intensive education programs to America's youth (grades K-8). Focus on conservation ethics. Expand the use of programs like Project Learning Tree and Project Wild.

(4) Applied Research and Demonstration - Carry out applied research and demonstration work to show the economics and environmental benefits of sustainable conservation practices and alternatives on privately held forest lands, including windbreaks and living snow fences.

(5) Information and Education - Expand the scope and purpose of Federal and state Information and Education programs to emphasize Information Management -- information systems, required information and processes (booklets; radio and television; media events).

COST-SHARING PARTNERSHIPS

Section 3 - The Secretary of Agriculture shall make available cost-sharing partnerships through the Forest Service, State and Private Forestry to States and other government entities to carry out a balanced educational effort to better manage the Nation's forest lands.

Federal cost-share for each partnership will not exceed 50 percent of the project cost. The non-federal share can be in the form of cash, services, or equipment as appropriate.

AUTHORIZATION OF APPROPRIATIONS

Section 4 - There are authorized to be appropriated to carry out the provisions of this subtitle, $20,000,000 in each of the fiscal years 1992 through 1995.

Appropriations to implement this section may be allocated to Federal agencies having jurisdiction over lands held or owned by the United States in the amounts necessary to assess and monitor forest health conditions on Federal lands.

Draft Input Into The 1990 Farm Bill
National Association of State Foresters
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ATTACHMENT B

ALABAMA'S
STEWARDSHIP PROGRAM
C.W. MOODY

Our forests are perhaps the most important element of what constitutes Alabama's and our Nation's environment. While the economic, recreational and wildlife contributions are well recognized, our rich forest lands also provide us with clean water, clean air, and soil fertility -- foundation elements for life itself.

Government programs of the past which have been directed toward assisting non-industrial private landowners (who own most of the nation's forestland), have been highly cost-effective. They have been excellent investments in the health of our forests with ensuing contributions to our Nation's wealth and environmental well-being. Such programs as the Soil Bank, Forestry Incentives Program, Agriculture & Conservation Program, the Conservation Reserve Program and Tax Incentives have all played an important role.

Government Agencies such as the Soil Conservation Service, U.S. Forest Service, U.S. Fish and Wildlife Service, and the Environmental Protection Agency have developed other programs aimed at protecting and enhancing our forests, water, air, wildlife, and our soil. Much of the time, however, these programs have been implemented by the sponsoring agency alone, and they have not been integrated into ongoing programs of other agencies. Landowners have, therefore, not received integrated and coordinated assistance in developing their forest resources. While all these have been good investments, this is not the most cost-effective way to invest federal dollars into this effort.

Congress must find new methods to achieve the necessary coordination and cooperation for programs designed to assist private forest landowners in achieving their forest resource objectives.

Our Nation's needs for forest resources will continue to increase. The need for wood fiber for products will increase. Demand for forest based recreation will accelerate. Critical wildlife habitat areas, such as wetlands, must be protected and, in some cases enhanced. Worldwide effects of global warming and acid rain are exacerbated by the poor stewardship practices of forest landowners. Our dependence on the elements which comprise and flow from our forests is of paramount importance to our Nation and, in fact, to the world.

Many of the concerns that we have mentioned have been with us for years. As previously stated, programs designed to address these issues are not well-coordinated in the past, and most times they are designed to repair damage after it has already occurred. Aggressive leadership and programs designed to prevent problems are needed.

Such leadership and such a program exists in Alabama. This program brings programs and agencies of all disciplines, such as wildlife, soil, water, forests, etc., together. This resource team approach is designed to help private forest landowners achieve their forest management objectives in such a way that all the resource values are protected and enhanced, in turn, maximizing contributions to the Nation.

The program to which we refer is called the TREASURE Forest Program. TREASURE is an acronym for Timber, Recreation, Environment, Aesthetics, a Sustained Usable Resource, and emphasizes multiple-use forest resource management. This program is outstandingly successful and has proven to be highly superior too and more cost-effective than regulation.

Today in Alabama there are over 600 landowners who are managing over a million acres towards the achievement of TREASURE Forest goals. The TREASURE Forest success story is a strong signal that landowner objectives can be met through voluntary actions and in such a way that other resource values are protected and enhanced. Concepts of TREASURE Forest must now be adopted at the national level.

Members of this committee can play a major role in implementing this concept at the national level. Congressman Sonny Callahan of Alabama is considering the introduction of legislation to create a national program designed after Alabama's TREASURE Forest Program. Implementation of this program will save billions of dollars in federal funding which will be required to pay for regulatory activities unless the Nation can deal with the problem through incentives, education and cooperation with forest landowners. This program will also assure billions of dollars in benefits to our nation from the resource benefits and values we have discussed.

The forests of the world, especially those in Asia, Africa, and South America are rapidly being depleted. Regulations controlling the management of forests are being proposed and put into place. But in many of these areas the forests are simply disappearing. This focuses an even stronger need for the United States to be responsible in the treatment of our forestland. The Southeast is an especially vital section for meeting world demand for timber and wood fiber. This is one of the few product areas in which we are competitive in international markets. At the same time, demands for other resource values continue to escalate in that region as well as other regions of the country.

Now is the time for strong national leadership in the area of forest resource stewardship. We must begin to recognize the potential of our forest resources and work to ensure that they contribute, to the maximum degree possible, to the generations of Americans that follow us.

ATTACHMENT C

NATIONAL FIRE FORCES MOBILIZATION ACT OF 1990

Introduction
The recent fire season in the Western United States (Yellowstone fires) pointed out again the need for National Legislation to address the Nation's wildfire problem.

The lack of fire suppression forces to handle peak periods of fire activity has been and will continue to be a severe problem that has prevented the adequate management of wildfire emergencies.

A vast network of fire fighters exists in the various State Forestry agencies and volunteer departments in this Nation. This pool of manpower represents a tremendous potential resource.

A full partnership of Federal, State and volunteer fire agencies can minimize rural homes and forest acres burned and resultant damage caused by uncontrolled wildfires.

The Problem
Simply stated the problem is that the federal forest fire protection agencies do not have adequate manpower to effectively deal with peak periods of wildfire activity. This situation has caused a tremendous loss of life, homes, forests and watersheds. This problem is being greatly aggravated by the increased construction of residences and other developments in the rural setting (urban/rural interface).

Opportunities
The wildland fire protection communities (Federal and State agencies and volunteers) must seize the opportunity to enhance the Nation's wildfires response capability. The timing is critical. Right now the public is fully aware of the lack of resources to effectively deal with "Yellowstone" class fire situation.

This proposed bill will:
Provide funding of $100 million.
This would provide for:
50% funding to volunteer fire departments nationwide
50% funding to State Forestry agencies.

Provides for State agencies and volunteer fire departments to be better equipped and trained. Allowing them to handle fires situations locally as well as provide a trained, equipped pool to draw from for national emergencies.

Enable Federal and State agency professionals to deal with fires locally, regionally and nationally without the need to resort to calling for assistance from untrained sources, such as military.

Utilize volunteer firemen who already have the commitment and some of the training as a tremendous pool of manpower to draw from during fire emergencies.

Provide resources for National System of Mutual Aid and Mobilization.

Capitalize on the current public sentiment concerning wildfire.

Capitalize on the considerable political potential of State Forestry agencies.

Make use of the considerable political potential of volunteer fire departments of this nation.

Utilize the increased awareness of the rural/urban interface problem.

Require nationwide coordination and cooperation of Federal, State and volunteer wildland protection agencies.

PROVISIONS OF NATIONAL FIRE FORCES MOBILIZATION ACT OF 1990

The Secretary, in consultation with the National Association of State Foresters, shall promulgate regulations as are needed for administration of this Act.

Funds provided under this Act shall be spent for public education and technology transfer, training and/or equipment necessary for effective mutual aid activities within the states and for supporting national mobilization but shall not be spent for construction of facilities.

All Federal funds provided under this Act shall be matched by State or local funds, on a 50-50 basis.

ATTACHMENT D

APPROPRIATIONS FOR STATE & PRIVATE FORESTRY FUNDS
(Dollars in thousands)

	Actual FY90	Admin FY91	NASF FY91
PEST MANAGEMENT			
Federal Lands			
S & TA	15,388	17,261	17,261
Suppression	15,970	18,008	18,008
Special Projects	2,835	2,970	2,970
Cooperative Lands			
S & TA	2,275	3,453	3,963
Suppression	10,572	0.0	14,200
AIPM	4,348	0.0	0.0
Subtotal FPM	51,386	41,692	56,392
FIRE PROTECTION	14,228	4,011	30,000
MANAGEMENT & UTILIZATION			
Resource Mgt	13,339	5,684	44,284*
Stewardship			
Rural Development**			
Wood Utilization	988	1,500	1,500**
Seedlings, Nursery	1,877	1,730	2,500
Urban Forestry	2,767	2,000	3,500
Subtotal FM&U	18,971	10,914	51,784
SPECIAL PROJECTS	19,663	0.0	0.0
TOTAL. S&PF FY 90	104,248	56,617	140,576

* Resource Management:

$25	Forest Stewardship
$13.6	Rural Development Through Forestry
$5	Rural Development
$5	Marketing Initiative
$3.6	Timber Bridges**

NATIONAL ASSOCIATION OF STATE FORESTERS

1990 EXECUTIVE COMMITTEE

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March 9, 1990

The Honorable Wyche Fowler, Jr.
Chairman
Conservation & Forestry Subcommittee
United States Senate
Washington, D.C. 20510

Dear Senator Fowler:

I appreciated the opportunity to testify before your Committee on behalf of the National Association of State Foresters (NASF) on March 1. As you know, my comments were specifically directed to Forest Stewardship and fire protection. At this time, I would like to submit additional comments on the America the Beautiful Program for your review.

NASF supports this new initiative sponsored by the Administration. As you know, $175 million is proposed in the Forest Service budget to plant an additional one billion trees a year in our communities and rural areas. Of this, $110 million is for tree planting and improvement in rural areas and $65 million for planting and caring for community trees. As the primary cooperators who will be responsible for delivering this ambitious program, NASF believes the potential exists to accomplish the goals of this initiative. However, there are several concerns to be examined.

The numbers are not yet available for 1989, but over three million acres of trees were planted across the nation in 1988. More than a million and a half were nonindustrial private acres. Public and private nurseries produced over 2 billion seedlings in 1988. NASF believes the capacity exists to plant and maintain another one billion trees annually. A highly successful network and delivery system already exists to accomplish this goal.

The first concern I raise is this: how are we going to get people to plant these additional trees? The President proposes that the federal government share the planting costs 50-50 to plant trees on economically marginal and environmentally sensitive agriculture cropland and pastureland. There are plenty of acres that can be planted in trees, but there are going to have to be more incentives offered to landowners beyond cost-sharing establishment costs, to achieve the President's initiative.

Of the 1.6 million private tree acres planted in 1988, 600,000 acres were planted under the Conservation Reserve Program (CRP). Eligibility requirements limit many acres from being entered into this program. Even with two attractive incentives -- cost-sharing establishment costs and ten year rental payments made to landowners retiring their erodible cultivated cropland, just over 2 million of the 30 million CRP acres have been planted in trees. The State Foresters feel that many of the "easier" acres have been planted and we have been working hard to encourage USDA to offer additional incentives to attract landowners willing to plant trees. This indicates that meeting the President's goals, requires considering other forms of incentives.

A second concern of the State Foresters with the rural tree planting program is the delivery system. We understand that it will be modeled very much after two other existing programs: the Forestry Incentives Program (FIP) and the Agricultural Conservation Program (ACP). The State Foresters will be instrumental in implementing and making this program a success. Experience with these other programs shows it is critical that the State Foresters be involved first hand in developing the national guidelines and approval process for accepting land into this program. This is essential if we are to plant significant numbers of trees in the mid-west and western states.

The goal of the $65 million community tree program is to plant 30 million trees a year in nearly 40,000 cities, towns and communities throughout the country. Thirty million dollars will be provided through the Forest Service, to State Foresters and other cooperators, to build upon existing technical assistance delivery systems. The other $35 million is to provide for a non-profit foundation that will raise funds, promote the program and mobilize the public, corporate and civic sectors to work cooperatively.

There are several well known, non-profit organizations already doing what is proposed for the Foundation. At the national level, the American Forestry Association and the National Arbor Day Foundation both have excellent tract records in mobilizing small and large communities through programs like "Global Releaf" and "Tree City USA." It would be disappointing to see their efforts and accomplishments supplanted. I urge you to carefully examine how the Foundation fits in with existing successful programs.

Finally, the Forest Stewardship Program, funded by Congress at $6 million in fiscal year 1990, has not been continued by the Administration. Instead, the term 'stewardship' is used to describe America the Beautiful, but it is not the program as we know it. A major difference between the Stewardship Program and America The Beautiful is that America The Beautiful is a tree planting program. Stewardship is a program that seeks to reach landowners who currently do not manage their land. Additionally, a key element of Stewardship is the coordination and cooperation of various agencies and organizations concerned with natural resource management. The State Foresters have made Stewardship a priority this year. NASF is working to see this program funded at $25 million for FY 1991 and the next five years.

NASF thanks you for your past support of the Stewardship Program. We hope you continue to support it in the future.

If I can be of assistance to you, please do not hesitate to call on me.

Sincerely,

CW Moody

C. W. Moody
Alabama State Forester

Senator **Fowler**. Thank you very much, Mr. Moody.
Mr. Neal.

STATEMENT OF JAMES E. NEAL, SOUTHERN REGIONAL EXTENSION FORESTER, THE UNIVERSITY OF GEORGIA, ATHENS, GA

INTRODUCTION

Mr. **Neal**. Mr. Chairman, my name is Jim Neal. I am the Southern Regional Extension Forester. I work for 13 State Cooperative Extension Services in the South. I work out of the University of Georgia in Athens. I have been an extension worker for 25 years. I am a member of the Board of Directors of the Forest Farmers Association, and a tree farmer in South Carolina for the last 25 years. Prior to that, I was a forester with Westvaco in South Carolina. I work closely with the Forest Service, the State forestry agencies, like Bill Moody, the Forest Farmers Association, and many forest industries. We each have our roles, and they are complementary. Extension's role is education, and I would like to talk with you about this role.

My statements are directed toward the support of the Renewable Resources Extension Act, the Forestry Incentives Program, and marketing.

RENEWABLE RESOURCES EXTENSION ACT (RREA)

The Renewable Resources Extension Act was passed in 1978 and first funded in 1982. Although the act authorized a funding level of $15 million, funding has never exceeded $2.7 million—the level of the past 3 years. Extension has leveraged these dollars, however, to bring more State and other funds into the system. For each Federal dollar spent in RREA since its beginning, $3 have been generated from other sources. Prior to RREA in the South, and I can just speak for the South at this time, there were less than 50 natural resource specialists in 13 States. Today, there are over 90. Many of these have been due to RREA.

The RREA legislation is designed to provide educational information to the American people on the management of renewable natural resources and how to receive economic and environmental benefits from them.

Extension as a part of the knowledge base of the land-grant university system is in position to provide landowners with the best educational information on natural resources management. Extension has the educational network of trained people in every county in the United States—3,000 plus. The Cooperative Extension Service provides a direct link between university research and on-the-ground technical assistance by the State forestry agencies and others. Extension has been hindered in its role, however, because we have had funding levels which have not kept pace with the rapidly emerging natural resource issues and some past Federal programs, for example, CRP.

We encourage this committee to include an Extension educational component along with the technical assistance and financial assistance in future Federal natural resources programs like the 1990 farm bill, stewardship, and the "America the Beautiful" program.

An excellent outline of an Extension educational role is provided in the National Association of State Land-Grant Universities and Colleges' suggestions for the farm bill. (See pp. 310 to 312.)

In cooperation with the Forest Service, State forestry agencies, Forest Farmers Association, and others, Extension can provide the educational role necessary in natural resource programs. We urge the committee to make certain there is an Extension educational component in the forest subtitle of the 1990 farm bill and other Federal initiated programs in the future.

I have some handouts to back up some of the things that Extension has been doing with RREA dollars.

FORESTRY INCENTIVES PROGRAM (FIP)

Let me speak a moment about Forestry Incentives Program, as you asked me to do.

FIP has been a long-term outstanding USDA program for private landowners through State forestry agencies. It has been limited, however, because of funding. The waiting list for FIP and ACP assistance in most counties is too long for many people to sign up for planting trees or making forestry investments. So they get discouraged and they do nothing. And I can speak to that as a tree farmer myself.

The committee is encouraged to look favorably to the funding of forestry cost-sharing programs. The cost-share dollars will be used by landowners if available.

Senator FOWLER. Is 50/50 enough on the cost-share?

Mr. NEAL. For?

Senator FOWLER. For the FIP.

Mr. NEAL. For the FIP? I think that most of the programs, particularly the President's program, I do not believe it is going to do it. FIP has worked in the past. It seems to be working now. It is a different kind of a program in tree planting, but when we are talking extensive site preparation work, we are talking big dollars and whether the landowners have the dollars to match, it is questionable. Does that answer your question?

Senator FOWLER. Yes, sir. Go ahead. I didn't mean to interrupt you.

Mr. NEAL. That is all right.

MARKETING

The marketing of forest products in the United States is no longer local, or national, but it is global. The transfer of information on global marketing to wood products industries is an educational program, and should be accomplished through the cooperative efforts of universities, through international trade centers, Extension, the Forest Service and State forestry agencies. In the South, university international trade development centers are being considered at Georgia, West Virginia, Clemson in South Carolina, Florida, North Carolina State, and Auburn University in Alabama, which covers the Gulf region.

Again, I would urge the committee to continue to look at and fund marketing and forest product programs in the 1990 farm bill.

Thank you, Mr. Chairman, for listening to me.

[The prepared statement of Mr. Neal and other related information follows:]

Subcommittee on Conservation and Forestry
Committee on Agriculture, Nutrition and Forestry
Chairman, Senator Wyche Fowler
U.S. Senate
March 1, 1990

Mr. Chairman and members of the Committee, my name is Jim Neal, Southern Regional Extension Forester for 13 state Cooperative Extension Services in the South. I work out of the University of Georgia in Athens. I am a member of the Board of Directors of the Forest Farmers Association and a Tree Farmer in South Carolina.

I work closely with the Forest Service, the state forestry agencies, the Forest Farmers Association and many forest industries. We each have our roles and they are complementary. Extension's role is education and I would like to talk with you about this role.

My statements are directed toward the support of the Renewable Resources Extension Act, the Forestry Incentives Program and Marketing.

Renewable Resources Extension Act

The Renewable Extension Act was passed in 1978 and first funded in 1982. Although the Act authorized a funding level of $15 million funding has never exceeded $2.7 million -- the level of the past 3 years. Extension has leveraged these dollars, however, to bring more state and other funds into the system. For each federal dollar spent in R.R.E.A., $3 have been generated from other sources. Prior to R.R.E.A. in the South there were less than 50 natural resource specialists in the 13 states. Today there are over 90 specialists.

The legislation is designed to provide educational information to the American people on the management of renewable natural resources and how to receive economic and environmental benefits.

Extension as a part of the knowledge base of the land grant university system is in position to provide landowners with the best information on natural resources management. Extension has the educational network of trained people in every county in the U.S. The Cooperative Extension Service provides a direct link between university research and on-the-ground technical assistance by the state forestry agencies. Extension has been hindered in its role, however, because funding levels have not kept pace with rapidly emerging natural resource issues and past federal programs (eg. C.R.P.).

We encourage this committee to include an Extension educational component along with the technical assistance in future federal natural resources programs (eg. 1990 Farm Bill, Stewardship, and "America the Beautiful"). An excellent outline of an Extension educational role is provided in the National Association of State Land Grant Universities and Colleges suggestions for the Farm Bill (pages 31, 32, 33).

In cooperation with the Forest Service, state forestry agencies, Forest Farmers Association, and others, Extension can provide the educational role necessary in natural resources programs. We urge the committee to make certain there is an Extension educational component in the Forestry Subtitle of the 1990 Farm Bill and other Federal initiated programs in the future.

Forestry Incentives Program

F.I.P. has been a long-term outstanding U.S.D.A. program for private landowners through state forestry agencies. It has been limited, however, because of funding. The waiting list for F.I.P. and A.C.P. assistance in most counties is too long for many people to sign up for planting trees and making forestry investments.

The Committee is encouraged to look favorably to the funding of forestry cost sharing programs. The cost-share dollars will be used by landowners if available.

Marketing

The marketing of forest products in the U.S. is no longer local, or national, but global. The transfer of information on global marketing to wood products industries is an educational program and should be accomplished through cooperative efforts of Universities (International Trade Centers), Extension, the Forest Service and state forestry agencies. In the South, university international trade development centers are being considered at Georgia, West Virginia, Clemson in South Carolina, Florida, North Carolina State, and Auburn University in Alabama (covers the Gulf region).

The committee is urged to continue to look at and fund marketing forest products programs in the 1990 Farm Bill.

Questions the SubCommittee Might Ask of Jim Neal
March 1, 1990

Question 1

Can you give the committee examples of successful programs funded by R.R.E.A. dollars?

Question 2

What would the Cooperative Extension Service do with the additional R.R.E.A. dollars?

Question 3

Have you had any experience with government cost-share programs as a forest landowner?

Question 4

What has been your experience with educational programs concerning marketing forest products?

Forestry Day in the South - February 17, 1990

by

Jim Neal

Southern Region Extension Forester

Almost 900 landowners attended the 3rd annual "Forestry Day in the South" meetings in 8 cities in the South. The meetings were sponsored by the Cooperative Extension Services in cooperation with federal, state and private organizations.

The meetings were held in Richmond, VA; Cincinnati, OH; Covington, KY; Nashville, TN; Jacksonville, FL; Little Rock, AR; Lake Charles, LA; Dallas, TX, and Jay, OK.

The participants were forest landowners who are mainly absentee landowners. This was the targeted audiences. Surveys of the participants indicated that over one-half of the people had never attended a forestry education meeting. It was a new audience of landowners.

Topics discussed at the meetings were taxation, forest management, marketing, timber products, wildlife management, regeneration, record keeping, the use of herbicides, environmental considerations and more.

Past meetings of "Forestry Day in the South" have been held in Atlanta, Charlotte, Memphis, Tallahassee, Oklahoma City, Tulsa, and Dallas.

February 26, 1990

International Paper Company Tree Offer

by

Jim Neal

Southern Region Extension Forester

On January 23, 1990 International Paper Company offered the Cooperative Extension Service free, genetically improved loblolly pine seedlings for planting in communities and rural areas in the South. The only reservation I.P. had was the program should not interfere with state nurseries selling trees.

Contact was made with Extension foresters in the South where loblolly naturally grows. The Extension foresters worked with local county agents and 4-H leaders in getting the information to 4-H youth and to community leaders in Arkansas, Georgia, Mississippi, Alabama, Louisiana, and South Carolina.

Since January 23, almost 5 million trees have been distributed and will be planted in rural and urban areas in six states.

The Extension system of forestry specialists working through county Extension offices made this spontaneous offer by International Paper Company successful. The reaction by Extension was immediate. The right people in the communities were contacted and they responded in a favorable manner. Instead of 5 million seedlings being buried, they will be planted. This program coincides with President Bush's announcement of the "America the Beautiful" program.

International Paper Company was overwhelmed with the quick response and they are making plans to offer a similar program in 1991 working through the Extension Services.

February 26, 1990

SOME EXAMPLES

OF 1989 RREA ACCOMPLISHMENTS

SOME 1989 EXTENSION FORESTRY ACCOMPLISHMENTS

IMPACTS OF NON-INDUSTRIAL PRIVATE LANDOWNER EDUCATION PROGRAMS

- AL, AR, CA, ID, MS, TN PROGAMS REACHED 17 THOUSAND, WHO VALUED THE INFORMATION AT $19 MILLION
- 16 OTHER STATES REACHED 160 THOUSAND, FOR AN ESTIMATED VALUE OF INFORMATION OF $180 MILLION
- REFORESTATION IN A SEVEN-COUNTY AREA OF FLORIDA INCREASED BY 58 PERCENT BECAUSE OF EDUCATIONAL PROGRAMS. VALUE AT HARVEST OF ADDITIONAL TREES PLANTED WAS $2.7 MILLION MORE THAN THE PREVIOUS PLANTING LEVEL. (FL08IS)
- IOWA, SOUTH CAROLINA, AND OREGON TRAINED 63, 47, AND 86 MASTER WOODLAND MANAGERS RESPECTIVELY. MANAGERS SO TRAINED PROMISE TO TRAIN OTHERS IN RETURN. (IA-RREA) (SC-RREA) (OR33)
- MISSISSIPPI'S "PROFITABLE HARVESTING AND MARKETING OF TIMBER" SHORTCOURSE TRAINED 250 LANDOWNERS IN THE PAST 3 YEARS. THEY VALUED THE INFORMATION THEY RECEIVED AT $4 MILLION. (MS-RREA)
- ARKANSAS AND LOUISIANA CHRISTMAS TREE GROWERS INCREASED RETURNS BY $630 THOUSAND. (AR18) (LA10)
- FOUR FLORDIA NATURAL RESOURCE TV PROGRAMS REACHED AN ESTIMATED 11.2 VIEWERS. (FL27)
- MEMBERS OF THE EASTERN CONNECTICUT FOREST LANDOWNERS ASSOCIATION ADOPTED FORESTRY PRACTICES 3 TO 5 TIMES AS OFTEN AS NON-MEMBERS. EDUCATIONAL PROGRAMS OF EXTENSION FOR MEMBERS RESULTED IN 3 TIMES AS MUCH TIMBER STAND IMPROVEMENT, 5 TIMES AS MUCH WILDLIFE HABITAT IMPROVEMENT, AND USE OF PROFESSIONAL FORESTERS 3 TIMES AS OFTEN WHEN HARVESTING TIMBER. MEMBERS PLANTED MORE TREES, RECEIVED HIGHER PRICES FOR TIMBER AND EARNED MORE THAN $1.4 MILLION SINCE JOINING THE ASSOCIATIONS. (CT45IS)

SOME 1989 EXTENSION WOOD PRODUCTS ACCOMPLISHMENTS

IMPACTS OF HARVESTING EDUCATIONAL PROGRAMS

- ALABAMA RECOGNIZES AN OUTSTANDING LOGGER EACH YEAR, DEMONSTRATES NEW LOGGING EQUIPMENT AND TECHNIQUES, EMPHASIZES LOGGING SAFETY, AND PROMOTES BEST MANAGEMENT PRACTICES (AL25A)
- NORTH CAROLINA PINE STRAW PRODUCTION INCREASED 10 FOLD (TO $10 MILLION) (NC-RREA)

EFFICIENCY IN WOOD PROCESSING

- MAINE FIRMS SAVED $70 THOUSAND EACH YEAR AFTER EMPLOYEES WERE TRAINED IN TECHNICAL WOOD PROCESSING OPERATIONS SUCH AS DRYING AND GLUING. DRY KILN FIRMS SAVED FROM $2 TO $150 THOUSAND PER YEAR AFTER ATTENDING KILN DRYING SHORT COURSES. (ME03)
- MISSISSIPPI KILN OPERATORS WHO COLLECTIVELY DRY 60 MILLION FEET WEEKLY VALUED THE TRAINING THEY RECEIVED AT $100 THOUSAND PER YEAR (MS47)
- A NEW HAMPSHIRE FIRM SAVED 250 THOUSAND GALLONS OF OIL AND $200 THOUSAND BY SWITCHING TO WOOD RESIDUE FUEL. (NH18) A NORTH CAROLINA FIRM SAVED $72 THOUSAND BY SWITCHING. (NC07)
- A NORTH CAROLINA COMPUTER QUALITY CONTROL PROGRAM FOR VENEER AND PLYWOOD PRODUCTION SAVED FIRMS OVER $450 THOUSAND. (NC07)

WOOD INDUSTRY DEVELOPMENT PROGRAMS

- MONTANA FORMED AN INTERMOUNTAIN ROUNDWOOD ASSOCIATION WITH 500 MEMBERS IN MT, ID, WY, ND, SD, REPRESENTING SALES OF $25 MILLION. (MT25)
- THE MISSISSIPPI FOOD AND FIBER CENTER CONDUCTED NUMEROUS INDUSTRY FEASIBILITY STUDIES AND INDUSTRY PROMOTION ACTIVITIES. (MS49)

YOUTH AND CONSUMER PROGRAMS

- 11 THOUSAND ALABAMA YOUTH DEVELOPED SKILLS IN USING WOOD (AL07C)
- SOUTH CAROLINA REDUCED MOISTURE DAMAGE TO HOMES BY INFORMING 350 THOUSAND HOMEOWNERS, AND SAVING AT LEAST $280 THOUSAND. (SC35)

SOME 1989 EXTENSION WILDLIFE ACCOMPLISHMENTS

INTEGRATING FORESTRY AND WILDLIFE

- o THE POTENTIAL FOR INCREASED INCOME FROM INTEGRATING FORESTRY AND WILDLIFE MANAGEMENT WAS DEMONSTRATED ON A 300 ACRE TRACT IN SOUTH CAROLINA. THE AREA WAS LEASED FOR HUNTING FOR $5.25 PER ACRE PER YEAR, AND USED FOR FIELD DAY DEMONSTRATIONS.

- o EXTENSION AND THE CALIFORNIA DEPARTMENT OF FISH AND GAME ARE COOPERATING TO CONSERVE 8 MILLION ACRES OF PRIVATE HARDWOOD RANGE SUCH THAT OAK REGENERATION IS IMPROVED, WILDLIFE HABITAT SUSTAINED AND IMPROVED, AND RANGELAND IS IMPROVED. (CA44)

MANAGING WILDLIFE PROGRAMS

- o NORTH CAROLINA, SOUTH CAROLINA, AND ALABAMA HAVE DEVELOPED 3 VIDEOTAPES ON DEER MANAGEMENT ON PRIVATE LANDS IN THE SOUTHEAST, INTENDED FOR MANAGERS, BUT ALSO USEFUL IN EXPLAINING MANAGEMENT TO THE PUBLIC.

- o VIRGINIA, COLORADO, AND ALABAMA JOINED WITH OTHER FEDERAL AND STATE AGENCIES TO PRODUCE LEAFLETS AND POSTERS ON THOSE ASPECTS OF THE CONSERVATION RESERVE PROGRAM THAT RELATE TO WILDLIFE, SUCH AS THE SWAMPBUSTER PROVISIONS. KANSAS AND OTHERS DEVELOPED 11 VIDEOTAPES ON THE CRP PROGRAM TELLING HOW IT CAN BE USED TO BENEFIT WILDLIFE.

- o A FOURTH EASTERN WILDLIFE CONFERENCE WAS SPONSORED BY EXTENSION

- o BEAVER DAMAGE CONTROL IN ARKANSAS SAVED OVER $146 THOUSAND. (AR21)

- o SMALL GAME WILDLIFE HABITAT IMPROVEMENT PLANS WERE PREPARED IN TENNESSEE TO QUALIFY LANDOWNERS FOR SMALL GAME COST SHARE PROGRAMS. 18 PLANS COVERING 4460 ACRES WERE WRITTEN, WITH OWNERS RECEIVING AN AVERAGE OF $225 EACH.

- o VALUE OF PRAIRIE DOG CONTROL WORK TO PARTICIPANTS IN COLORADO WAS $35 THOUSAND, AND VALUE OF ANIMAL DAMAGE CONTROL TO GARDENERS WAS $50 THOUSAND. (CO27)

- o WILDLIFE MANAGEMENT PLANS ON AN ADDITIONAL 12 THOUSAND ACRES IN LOUISIANA (LA38)

- o MISSISSIPPI'S 41 WORKSHOPS ON WILDLIFE MANAGEMENT REACHED 13 THOUSAND LANDOWNERS AND SPORTSMEN. (MS60)

- o DAMAGE TO VIRGINIA ORCHARDS WAS REDUCED BY 35 PERCENT BY INTRODUCING A NEW RODENTICIDE. (VA01)

YOUTH AND PUBLIC WILDLIFE PROGRAMS

- THE 4-H WILDLIFE JUDGING PROGRAM WAS EXPANDED INTO A NATIONAL INVITATIONAL WILDLIFE JUDGING CONTEST, WHICH PROMISES TO PROVIDE ADDITIONAL INCENTIVE TO 4-H YOUTH, 300 THOUSAND OF WHOM ALREADY PARTICIPATE IN WILDLIFE PROJECTS.
- 1 MILLION NEW YORKERS INCREASED AWARENESS OF THE INTERACTION OF HUMAN LAND USE AND WILDLIFE (NY21)

FISH MANAGEMENT PROGRAMS

- FEE FISHING OPPORTUNITIES FOR PRIVATE LANDOWNERS WERE DEMONSTRATED ON THREE PONDS IN GEORGIA. THE DEMONSTRATIONS PROVIDED 20 THOUSAND HOURS OF RECREATIONAL FISHING AND INCREASED INCOME OF $16 THOUSAND.

SOME 1989 EXTENSION RANGE AND PASTURE MANAGEMENT ACCOMPLISHMENTS

GRAZING MANAGEMENT

- USE OF PASTURE PROBE SAVES CALIFORNIANS $30 PER ACRE (CA43)
- NEW COLORADO GRAZING SYSTEM INCREASES BEEF PRODUCTION BY 27 TO 50 PERCENT, AND NET REVENUE BY 15 TO 35 PERCENT. (CO16)

PASTURE MANAGEMENT

- CONNECTICUT DEMONSTRATIONS HAVE INCREASED FORAGE PRODUCTION BY $1000 PER FARM, AND FERTILIZER INPUTS ON 24 FARMS HAVE BEEN REDUCED BY $86 THOUSAND. (CT04)
- 400 NEW YORK DAIRY FARMERS HAVE SAVED UP TO $900 PER COW IN FEED COST THROUGH INTENSIVE MANAGEMENT OF PASTURE, AND MARYLAND HAS DOCUMENTED $700 TO $800 ANNUAL SAVINGS FOR DAIRY FARMERS WHO ALLOW COWS TO HARVEST THEIR OWN FEED. (MD09)

RIPARIAN MANAGEMENT ON RANGELANDS

- WORKSHOPS, DEMONSTRATIONS, AND FIELD DAYS HAVE BEEN HELD THROUGHOUT THE WEST.

COORDINATED RESOURCE MANAGEMENT

- UTAH IMPROVED MANAGEMENT ON 1.5 MILLION ACRES (UT07), AND WASHINGTON ON 775 THOUSAND ACRES (WA25). TEXAS HAD A 100 PERCENT ADOPTION RATE FOR PARTICIPANTS IN ITS TOTAL RANGE MANAGEMENT PROGRAM.

RANGELAND WEED CONTROL

- UTAH WEED CONTROL SAVED OWNERS $375 THOUSAND (UT07). WASHINGTON WEED MANAGEMENT PROGRAMS COVERED OVER 750 THOUSAND ACRES OF RANGELAND (WA25).

INTEGRATED RESOURCE MANAGEMENT

- GRAZING AND PASTURE MANAGEMENT TECHNOLOGIES HAVE BEEN INTEGRAL COMPONENTS OF THE WIDELY SUCCESSFUL IRM PROGRAMS IN A NUMBER OF STATES.

SOME EXAMPLES

OF 1989 RREA ACCOMPLISHMENTS

(FURTHUR DETAIL)

:HEADLINE
Selected accomplishments of forest management Extension programs, 1989

:TEXT
*IMPACT BULLETS

- Forest management educational programs in AL, AR, CA, ID, MS, and TN reached over 17 thousand non-industrial private forest owners, who estimated the collective value to them at over $19 million. Similar educational programs in CT, FL, KT, LA, ME, MD, MN, MT, NJ, NY, NC, OR, PA, SC, WA, and WI reached 160,000 additional landowners. Th collective area of non-industrial forestland impacted by educational programs in AL, AR, CA, ID, IL, MD, MI, MN, MS, NY, NC, OR, PA, SD, VA, and WA was over 12 million acres. Other States did not report number of dollars, landowners, or acres, so these figures represent only partial impacts of the total program.

- In an Alabama impact study (AL98IS) of adoption of forest management practices by landowners who attended forestry meetings, 188 responses were received. Ninety-six percent said the information they received helped them manage their forestland. Ninety-seven percent were interested in attending future meetings. Eighty percent put the information to practice. Actual acres and practices undertaken were:

  7,760 acres of site preparation
  23,031 acres of planted pines
  1,045 acres of pine released
  4,486 acres of timber stand improvement
  1,549 acres of seedtree or shelterwood harvests
  22,572 acres of prescribed burning

- The favorable impact from organizing an Eastern Connecticut Forest Landowners Association and conducting educational programs for its members was measured by comparing forest practices of member to a random sample of non-members (CT45IS). Members did three times as much timber stand improvement, used professional foresters to mark timber three times as often, and did five times as much wildlife habitat improvement. Members averaged $3,800 additional income from forestry practices undertaken.

- The impact of a Florida reforestation educational program in a seven county target area (FL88IS) was a 58 percent increase in acres reforested, compared to the base period. At harvest time, the annual income in the seven counties from the trees planted during the base period (before the educational program) will be $4.5 million, whereas the annual income due to the accelerated planting will increase to $7.2 million.

- Forestry Extension education programs in Georgia helped establish a world tree planting record during the 1987-88 planting season -- 603,000 acres. This was nearly 30 percent of all the National Conservation Reserve tree planting. (GA-RREA)

- Iowa provided 32 hours of intensive forestry instruction for 63 "Master Woodlot Managers," who each agreed to give back at least 32 hours of public service in forestry (IA-RREA). South Carolina conducted a similar program for 47 landowners (SC-RREA). Oregon trained 86 master woodland managers. (OR-33).

- Illinois developed and exhibited displays explaining and promoting forestry and natural resource management at State and county fairs and similar events, reaching more than 2 million citizens (IL-RREA)

- Mississippi's "Profitable Harvesting and Marketing of Timber" shortcourse (10 hours of instruction over 5 weeks) trained 250 landowners in the past three years. These landowners themselves placed a value of more than $4 million on the information they received. (MS-RREA)

- Extension in New York joined with the Small Business Energy Efficiency Program to reduce energy consumption by maple syrup producers by 30 percent, which meant an average savings per producer of $684.

- Educational programs for Arkansas Christmas tree growers increased their returns by $114 thousand. (AR 18). Five hundred Ohio growers adopted improved management practices, emphasizing weed management in plantations. (OH 60) Louisiana's Christmas tree production increased by $516 thousand. (LA 10)

- Four television programs about forest and natural resource topics reached all major metropolitan areas in Florida -- an estimated 11.2 million viewers. (FL 22)

- Extension education programs contributed to the planting of 2.1 million trees in Nebraska, training for 500 tree-care professionals, improvement in 50 community forestry programs, and continuing education for 70 natural resource professionals. (NE 83)

- Sixty-three limited resource landowners in North Carolina began or expanded forestry enterprises. (NC 38)

- 24,935 youth were enrolled in conservation programs in Virginia (VA 17)

*SCOPE
This is a synthesis of nationwide Extension forestry accomplishments, but only a few States could be included, and only some of their accomplishments. No inference about other accomplishments or about accomplishments of other States is intended.

*SITUATION
Despite active Extension forestry programs in most States, the need for these programs continues for the following reasons: 1) Size of potential audience -- there are over 7 million owners of private forest land, 2) Location of owners relative to their land -- many absentee owners, some seldom if ever visit their land, 3) Changes in ownership -- many new owners each year, 4) Lack of information about the potential -- few owners have knowledge about scientific forest management, 5) Objectives of ownership vary -- often financial income is not very important, 6) concerns for environment -- how private forests are managed can affect the environment, 7) Concerns for public land for other-than-forest production -- Withdrawal of some public lands puts more pressure for forest production on private lands.

*PROGRAM SPOTLIGHTS
Private forest landowners hold the key. They can be reached by Extension programs, and they do take action. The six States that collected information about the value of programs to owners (AL, AR, CA, ID, MS, TN) reached 17 thousand owners who valued the information at $19 million dollars. Sixteen additional States reached 160 thousand owners. If the same ratio of value of information per owner reached holds, the collective value to all 177 thousand owners would have been $200 million for the 22 State which reported numbers of owners reached.

*COMPLETED BY
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*DATE
January 30, 1990

:HEADLINE
Selected accomplishments of Wood Products Extension programs, 1989

:TEXT
*IMPACT BULLETS

o About 11,000 Alabama 4-H'ers acquired knowledge and developed skills in the selection and use of difference types of wood and wood products as well as developing skills in the selection, care and safe use of woodworking tools and machines. (AL07C)

o A Timber Harvesting Extension program provides recognition through the Alabama Outstanding Logger Award, demonstrates new harvesting equipment and techniques, including a Scandanavian mechanized harvesting system that has potential for thinning pine plantations, and emphasizes logging safety, and Best Management Practices for logging operations. (AL25A)

o Savings of up to $70,000 per firm per year were achieved in Maine through in-plant training sessions for employees in subjects of wood machining technology, adhesive bonding of wood, circular saw fitting and maintenance, and drying. (ME03)

o The economic benefits of the Maine Wood Drying Short Course to provide owners and operators of lumber dry-kilns with both basic and advanced lumber drying technology ranged from $2,000 to $150,000 per firm per year. (ME03)

o 300 Mississippi forest landowners and foresters trained in timber marketing manage 150,000 acres of forest land and value the shortcourse information at $3 million. 95 dry kiln operators who account for drying 60 million board feet of lumber weekly value the training they received at $100,000. (MS47)

o The Mississippi Food and Fiber Center conducted an economic analysis of a dimension stock furniture operation, proposed dry kiln operations, two proposed chipping mill operations, a wood chip mill, a furniture frame operation, a proposed expansion of a wood pallet processing operation, and others. The Center coordinated an economic analysis regarding the opportunities for the location of several forest product operations in the State by a foreign investment group, sponsored a conference on manufacturing and marketing ready-to-assemble furniture, and published an informational brochure for industry recruiting purposes focusing on the opportunities, resources, and infrastructure for expanding the furniture industry. (MS49)

o Formation of the Intermountain Roundwood Association by Montana Extension, representing manufacturers of post-and-pole, log home and furniture companies in MT, ID, WY, ND, and SD. After 6 mos., I.R.A. has 50 members representing gross annual sales of $25 million. (MT25)

o New Hampshire specialists conducted educational programs to assist forest products processors and marketers in enhancing their competitiveness and profitability in domestic and export markets. Assistance to hardwood lumber producing firms resulted in a 30 percent average improvement which increased gross revenue by $750,000 per year. As a result of the feasibility study for installing a wood residue fuelled system to operate dry kilns the firm became energy self-sufficient; wood residue fuel replaced some 250,000 gallons of fossil fuels and resulted in saving of some $200,000 per year. Establishment of a new firm to market wood chips for pulp manufacturing, biomass chips for energy generation and bark for agricultural and horticultural uses created gross revenues of over $250,000 per year, three new jobs, and new markets for low grade timber and residues. (NH18)

- o A North Carolina Micro-computer program in Quality Control for Veneer and Plywood production has resulted in over $450,000 in savings. The use of wood residues for energy saved $72,000 for one firm. A single firm saved $100,000 annually through reducing dry kiln lumber losses after attending educational programs on lumber drying. Three feasibility studies resulted in the construction of processing facilities producing chips and lumber for export. (NC07)

- o Georgia developed a lumber dry kiln monitoring program that is reducing costs to owners/operators through energy conservation and improved lumber quality. (GA-RREA)

- o Minnsota conducts an annual two-week Lumberman's Short Course for retail and wholesale lumber dealers that teaches wood purchase and use. (MN-RREA)

- o Pine straw production demonstrations were established in North Carolina to increase awareness of, and landowner income from pine straw production. Educational meetings were presented and a publication and videotape were also produced to educate potential suppliers. North Carolina landowner income from pine straw sales has increased from $1 million to over $10 million due to these efforts. (NC-RREA)

- o In conjunction with the Wisconsin Cooperative Extension Service, the Forest Service, and ES-USDA, the National Wood Products Extension Program is preparing a full text retrieval package on exterior finishes for wood, utilizing State-of-the-art commercial software. (WI-RREA)

*SCOPE
This synthesis is nationwide. Sample accomplishments are taken from AL, GA, ME, MN, MS, MT, NC, NH, and WI, but most States which have substantial forest resources conduct educational programs for their wood industry and for consumers.

*SITUATION
"Wood products" includes thousands of products used by industry and by consumers. The flow of these products to markets is sustainable. The production of wood can enhance rather than damage the environment. The wood industry is an important component of local economies wherever timber is grown, and where logs or other wood products are imported from tree-growing areas. Thousands of individual firms do not have the technical expertise to apply research to improve their performance. They depend on wood products extension to help them stay competitive. Wood products activities cut across Extension's National Initiatives and Critical Issues. The three Critical

Issues that relate most directly to wood products extension are: 1) Marketing Natural Resource Products and Services, 2) New Enterprises, and 3) Develop, Apply, and Transfer Technology

*PROGRAM SPOTLIGHTS
New permanent, sustainable jobs throughout rural America are resulting from wood industry expansion, and existing industry is improving its efficiency. Consumers are benefiting from improved use of wood. Landowners are encouraged to manage forests for wood products and for other private and public benefits. Producing wood requires little energy compared to most alternative structural materials, and the wood resources is renewable. It can be produced with beneficial impact on the environment, and it is biodegradable.

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1/5/90
JEM, NPL Fish
and Wildlife

RREA Success Story Examples

These 9 examples of State wildlife and fisheries accomplishments gleaned from State reports are indicative of the type of Cooperative Extension wildlife and fisheries programs presently underway in 36 States. Many of the States not referred to in this document have accomplished similar or even greater success stories and beneficial impacts. Through such educational programs conducted to help private landowners and managers improve the management of their natural resources, they have also increased public understanding, helped resolve conflicts, improved the quality of life in rural and urban communities, and improved economic stability.

1. Increased income from integration of forestry and wildlife management in SC. A 300 acre private tract was selected as a demonstration area and a long-range management plan was developed to optimize timber and wildlife production.

   Revenue from selected timber harvests are being received and the area is leased for hunting at $5.25 per acre, per year. Two field days have been conducted for interested landowners to demonstrate management options and income potential. In addition, a Fee Hunting Conference conducted at Clemson provided new management information to 175 professionals and landowners from across the south.

2. Integrated hardwood range management program in cooperation with CA Dept. of Fish and Game. A 10-year program of research and education devoted to the conservation of native oaks on 8 million acres of private hardwood rangeland. The four general goals of this cooperative effort are to: (1) improve oak regeneration; (2) sustain and enhance quality wildlife habitat; (3) identification of critical areas and improvement of hardwood rangelands; and (4) demonstration of economic alternative land-use planning/management strategies. Numerous workshops, training sessions, videos and publications are being developed and provided for use by landowner and local communities.

3. Result/Demonstration of fee fishing opportunities for private landowners in GA. Three 3/4 acre ponds have been utilized to demonstrate the management and profitability of marketing channel catfish and rainbow trout in a recreational fee fishing enterprise for use by the public. This demonstration has provided a total of 20,500 hours of recreational fishing for over 9,000 adults and youth over the past 3-years on these three ponds of 2.25 total acres and generated increased income of $16,000.

4. Public understanding and economic alternatives from wildlife management on private lands in the southeast. NC took the lead in utilizing RREA funds in a cooperative effort with SC and AL to develop 3 videotapes "Managing Deer Habitat, "Deer Leases and Management", and "Deer Herd Management." The principal audience for these educational programs are private landowners and managers, however they are also very useful for educating

the public about why whitetailed deer management is necessary. A master copy was provided to each southeastern state Extension wildlife specialist for their use and duplication as needed. In NC these types of information in conjunction with educational meetings have helped private landowners make decisions to improve management and lease access on over 75,000 acres over the past year.

5. Limited RREA resources were utilized by wildlife specialists in several states to leverage additional funding from the U.S. Fish and Wildlife Service and the International Association of Fish and Wildlife Agencies to expand the 4-H Wildlife Judging Program during 1989 into a National Invitational Wildlife Judging Contest which allowed 12 States to send 4-H judging teams to the national contest held in WV this year. The Wildlife Judging Contest involves 4-H members working with volunteer coaches to learn how to manage wildlife habitat and to make management decisions. With over 300,000 4-H'ers nationwide participating in wildlife projects, this program is anticipated to increase wildlife enrollment even more as new judging manuals are developed for western habitats. Present enrollment in all states that are beginning this relatively new wildlife judging contest is not known. However, in the state of Tennessee during 1989 total enrollment in the wildlife project was 31,586 and 4,247 members participated in 10 district and state wildlife judging contests. Also approximately 400 wildlife food plots planted by 4-H members in 44 Tennessee counties were judged in their FACE (Food and Cover Establishment) contest.

6. In TN, one pilot program begun in 1989 trained selected county agents to write small game habitat improvement plans for private landowners as a part of the Tennessee Wildlife Resource Agency (TWRA) small game cost-share program. As a result 18 excellent plans were written and approved for 4,460 acres with landowners receiving an average of $225 each in cost-shared funding. This program will be expanded in future years because of its positive results of: (1) increased cooperation between Extension, TWRA and private landowners; (2) increased acreage managed and improved for wildlife; (3) increased value of land improved, particularly for those involved in fee hunting operations and; (4) reduced expenditures of landowners because of their participation with TWRA in the cost-share program.

7. During the past three years, small investments of RREA resources have been used in VA, CO, and AL to leverage additional funds from the Fish and Wildlife Service, USDI and other Federal and State agencies to develop and print leaflets and posters on the CRP program, Swampbuster, Opportunities for Wildlife and Economic Benefits, Conservation Easements and Bottomland Timber Establishment on CRP Lands, that have been distributed by the hundreds of thousands through appropriate federal and state agencies to encourage farmers to reduce soil, water and wind erosion and improve wildlife habitat by putting highly erodible croplands into permanent vegetation. Many additional state and local publications, videotapes and teleconferences have been conducted across the nation by Extension wildlife specialists reaching both landowners and the public. A cooperative effort between KS, the Fish and Wildlife Service other State

Fish and Wildlife agencies and Cooperative Extension Services developed an 11 volume video-tape set on the CRP program, wetlands protection, improving wildlife habitat, maintaining windbreaks and shelterbelts and other related conservation practices. This videotape was made available for each state to be forwarded a copy for use in educational programs, and has been viewed by millions of people across the nation.

8. In another state a small investment of RREA resources was utilized to conduct the Fourth Eastern Wildlife Damage Control Conference. This continuing education Conference for professional wildlife and natural resource managers was attended by over 200 people from 35 states and several foreign countries. The conference proceedings will soon be available for distribution and sale.

9. In Arkansas a cooperative program with the Arkansas Game and Fish Commission called Acres for Wildlife has enrolled 1,768,564 acres of private land into a wildlife management program. In 1989 an additional 5,017 landowners enrolled another 129,232 acres in the program planting over 9,000 food plots and more than 80,500 tree and shrub seedlings for wildlife. Other educational programs on beaver damage control helped landowners reduce beaver damage on 12,665 acres of forest, crop and pasture lands resulting in a saving to those owners of over $146,000 in 1989.

OVERVIEW OF STATE RANGE AND PASTURE MANAGEMENT ACCOMPLISHMENTS

COOPERATIVE EXTENSION SERVICE, FY-1989

The following annotations from State accomplishment reports are examples of range and grazing land management programs currently underway in the Cooperative Extension System. These and other educational programs conducted for land owners, managers and users have helped to improve the management of natural resources through better understanding, planning, application and evaluation of resource technologies.

Grazing Management:
Extension programs improved the level of grazing management on rangelands in California, Utah, Colorado, Washington, Texas, Wyoming, and elsewhere. In California, an improved pasture inventory technology has resulted in savings up to $30 per acre for landowners who used the pasture probe devise to help plan their grazing programs (CA43). In Colorado, Extension cooperators have realized increases from 15 to 35% in net revenue per acre (27 to 50% increase in beef production) by adopting new systems of grazing. Other cooperators are benefiting from conversion of high-input marginal cropland to low-input grazing land with commensurate improvement in net returns (CO16).

Pasture Management:
Improved management of tame pastures used for dairy and beef production is an important element of Extension in many States. In Connecticut, forage and grazing demonstrations have increased the net production by $1,000 per farm. Forage production has been improved on 24 such farms and fertilizer inputs have been reduced by $86,000 (CT04). Arkansas Extension worked directly with over 1,200 farmers in forage production programs, corresponding to over 200,000 acres of forage improvement in the State during 1989. Mississippi (1890) Extension has contributed to 2,600 acres of improved pasture and grazing management (MS94). Extension grazing demonstrations were established on 18 farms/ranches in 12 Ohio counties (OH17). In New York, over 400 farms have adopted the grazing management recommendations of a joint Extension-SCS education program over the past few years. Dairy farmers who implement intensive grazing management on their farms typically save up to $900/cow annually in feed costs with no appreciable drop in milk production. Maryland's statewide pasture and grazing initiative has documented $700 to 800/cow annual savings for dairy farmers who allow the cows to harvest their own feed (MD09).

Riparian Management on Rangelands:
Rangeland Extension in California, Nevada, Utah, Oregon, Wyoming, New Mexico, Arizona, Washington, Idaho and elsewhere, have conducted educational programs for landowners, managers and the public about riparian management issues, concerns and technologies. Workshops on riparian classification have been conducted in Nevada,

California and Utah. Montana sponsored a state-of-the art riparian management workshop, Wyoming established new riparian management demonstrations. New Mexico has disseminated information resulting from recent grazing research on riparian areas. In the northwest, riparian workshops and field days complement Oregon's Watershed Improvement Coalition that continues to adopt new areas where conflicts will be resolved through a process of joint problem-solving.

Coordinated Resource Management:
Extension-sponsored coordinated resource management (CRM) areas were established or continued on millions of acres of rangeland in the west. Utah reports improved management on 1.5 million acres of CRM lands (UT13A) and Washington reports 775,000 acres that are covered by new CRM plans (WA25). California has improved integrated resource management on hardwood ranges by reaching 400 ranch owners interested in multiple use. Texas' Total Ranch Management program has had a remarkable 100% record of practice adoption by participants over the last three years, and trained another 65 Texas ranchers in 1989. State stewardship committees in Wyoming and Nevada continue to rely on Extension leadership, as do State rangeland committees in Idaho and Utah.

Rangeland Weed Control:
Extension programs directed toward control and management of range weeds were conducted in Washington, Utah, Wyoming, Montana, Nebraska and Texas. In Utah, Extension programs contributed to the containment of aggressive weeds in eight counties and reduction of weed infestations in five counties, resulting in a net $375,000 return to landowners (UT07). In Washington, weed management was a primary issue for the establishment of 48 Extension-driven Coordinated Resource Management areas covering 778,050 acres of rangeland (WA25). The Washington State program also published a quarterly newsletter about range weeds that was distributed to 1,200 recipients in four states and two provinces. Ten percent of the weed infested rangelands in Wyoming were treated in 1989, largely due to 75,000 copies of Extension Weed Bulletins distributed by that state.

Integrated Resource Management:
Grazing and pasture management technologies have been integral components of the widely successful IRM programs in a number of states.

Senator Fowler. Thank you, Mr. Neal, very much. I will have some questions in a second. Mr. Sampson, we welcome you.

STATEMENT OF R. NEIL SAMPSON, EXECUTIVE VICE PRESIDENT, AMERICAN FORESTRY ASSOCIATION, WASHINGTON, DC

Mr. Sampson. Thank you, Mr. Chairman, and before we start with our testimony today, I want to commend you for the leadership you have taken. You do not need to apologize to this person for going off to solve the Clean Air Act problem. I hope you did it.

Senator Fowler. I did.

Mr. Sampson. Because this is one forest——

Senator Fowler. Let the word go forth.

Mr. Sampson. Good for you. This is one forestry group that feels like if we could clean up some of the air problems in the country we might do as much for forests and forest health as anything else we could have done today. We appreciate that.

Senator Fowler. Here, here.

Mr. Sampson. The other thing that happened as a result was that I went back to my office and discovered the proceedings of our Fourth Urban Forestry Conference which took place in St. Louis in October, and I brought a copy for you and your staff, not for the record. I think it is a little large for the record but it should make a good reference for you and your staff.

Senator Fowler. Good.

Mr. Sampson. I was asked to speak on the urban and community parts of the forestry title of the farm bill and the President's proposal. I appreciate the chance for this opportunity.

QUESTIONS ABOUT THE ABILITY OF THE AMERICA THE BEAUTIFUL INITIATIVE TO REACH INTO PLACES LIKE SHELTERBELTS AND WINDBREAKS

Before I do begin that, however, I would like to speak of something that came up in the conversations this morning. There were questions about the ability of the America the Beautiful initiative to reach into places like shelterbelts and windbreaks. Very little came up about urban and community things, and I am going to talk about that. You have just talked about the cost-share percentage with folks who do programs much like the FIP program of the past.

WE ALSO NEED TO LOOK VERY CLOSELY AT THE INCENTIVES AVAILABLE IN THOSE PROGRAMS

My sense, Mr. Chairman, is that not only does there need to be a plan, and some goals, from the Department of Agriculture as was discussed this morning, but we also need to look very closely at the incentives available in those programs. The same incentives that drew excellent performance in tree planting in Georgia during the Conservation Reserve Program failed pretty miserably in drawing farmers into planting windbreaks and shelterbelts in the Midwest. It is a different problem. There are different things to address, and different incentives needed. It seems to me that it would be useful for the committee to keep the pressure on the Department to bring forth not just a plan and some goals, but some different implementation tracks designed specifically for these very, very different aspects of forestry.

Senator **Fowler**. And those differences are basically regional, are they not?

Mr. **Sampson**. Well, at times, but——

Senator **Fowler**. How would you describe the differences that you are talking about?

Mr. **Sampson**. Most of the windbreak, shelterbelt and stream corridor trees are not planted with an economic return in mind, and yet often they are planted on very, very tough sites. Often the trees that are planted are farther away from their natural site simply because people are trying to solve a tough conservation problem. This is much more difficult than to plant loblolly pine on a good site in one of the Southern States where it is an adapted species and the techniques are fairly well known. So the same cost sharing arrangement is simply not going to bring out the same kind of performance because very different problems are involved.

As we move into those Plains States, we get very dry, very tough sites. We have farmers without good experience in trees. A larger education component, for example, and some larger cost-sharing components, in a multiyear way, are needed. We used to calculate out in Idaho that in the first year after planting and that second year, the care that was done was as important as the planting itself. If you just planted the trees and went away, you were liable to lose that planting.

THE NEEDS OF THE URBAN AND COMMUNITY FORESTS

As I come to the urban aspects, let me share some information with you. Our data on urban and community forests is not very good. This last year, with the cooperation of the Forest Service and the State forestry agencies, a lot of nonprofit and citizen groups, our association did a good street tree survey of 413 communities in the country. What we discovered was that the street trees in America's communities are about half gone. We discovered about 49 percent of those spaces had a live tree and about 51 percent did not. That amounts to about a 60 million tree planting need in America's communities just to replace the street trees that are missing, let alone take care of the natural mortality and replacement needs.

Street trees comprise about 10 percent of the trees in an ordinary community forest situation. That opens up the possibility that the President's program, with its goal of 30 million additional community trees per year, is well within the magnitude of need that the data suggests exists out there. That is certainly not an unusual or large number. The other thing this survey showed, however, that was disturbing is that over 20 percent of the trees that exist are less than 3 inches in diameter, and two-thirds of them were less than 12 inches in diameter.

What this means is that there are a lot of young trees out there, and that means that they die young. That means that, in addition to tree planting, we need better tree care and management programs in communities as well as on rural lands. So the concept of stewardship Mr. Moody talked about on rural lands can be brought right to the community forest. The same needs exist there: technical assistance and educational assistance, committed citizens and local leaders who can, in fact, put a little money into the tree effort while every other kind of demand is pulling and tugging at them for scarce dollars.

So we are hopeful that the America the Beautiful program in addition to dealing with incentives for tree planting, provides the kind of technical assistance and incentives that help small communities build the capacity to manage and improve the care of the trees that they have. The average urban tree lives 32 years. Its value gets greater the larger it gets. What we are trying to do in communities is to get more canopy cover. You get canopy cover with mid to large size trees, not with little trees. So it is very important that that care programs be in place so that trees can live to be older and more valuable.

There has been a small urban forestry program, administered in conjunction with the State foresters, for about 10 years. There is a very thin but excellent framework of technical urban forestry knowledge around the country. The problem is that it is too thin. There needs to be significantly more assistance. We welcome the initiative proposed by the president to provide that kind of supplemental assistance. We need to also point out that additional research is also important in this one. Urban and community trees live in some of the worst environments available for plants to try to grow, and research needs to look at species and varieties that can tolerate the kind of droughty, poor soil, and polluted conditions that are characteristic of communities.

Senator FOWLER. Do you think the Extension Service's role in urban forestry should be expanded?

Mr. SAMPSON. There is a tremendous educational effort as well as a technical assistance effort involved here. Again, we think those agency roles have been well established in past practice. Basically, what they need is resources and encouragement, not redefinition of agency role.

The other problem we face in technology transfer, Mr. Chairman, is to get urban planners and designers and zoning authorities and street engineers to understand a little more about urban forestry. If they build an urban situation on which nothing can grow, the best forester in the country has a difficult time with it. At the community level, we seek to tie together a tremendously broad array of technologies, only a few of which are classified as forestry or arboriculture. The rest are a very diverse group of professionals, all of which need to cooperate if communities are going to see the values of their forest.

Mr. Chairman, we have had a campaign going since 1988 that we call Global ReLeaf. We picked up on people's concerns about the greenhouse effect and pointed out that forestry programs could be an important part of the necessary response. Community forestry programs are even more important than average. Around homes and businesses, trees in the right place can save 10 to 50 percent on a person's air-conditioning bill. In Washington, DC, we have a 4 degree heat island compared to our surrounding regions, and every degree Fahrenheit is estimated to cost our D.C. ratepayers $10,000 an hour on a summer afternoon. That is $40,000 an hour that we can save with such low-tech, low-cost technologies as improving the urban forests and putting white paint on black rooftops.

This is not rocket science. It is a chance for people to address an issue that is their face, that is costing them money. As a result of that, we have had the most incredible reaction to this program that you could imagine. Fourteen States, including your own State of Georgia, have adopted official Global ReLeaf campaigns; 120 cities have adopted official campaigns and that list keeps growing every week.

Over 1,000 communities have been involved in one way or another. We have over 150 cooperating nonprofit organizations now and nearly 50 companies, many of them in the Fortune 500 list, who are doing programs to assist Global ReLeaf campaigns at the State and local level. In this coming spring, we will have McDonald's testing an environmental education and seedling distribution campaign in nine cities including four of them in the Hurricane Hugo area. The Texaco company will focus their efforts on three cities, Denver, Houston, and New Orleans, and test a major tree improvement program that will support the efforts of cities and nonprofit groups, Texaco employees, and others.

We have a lot of people doing a lot of things as a result of Global ReLeaf. As a result, Global ReLeaf is the fastest growing privately sponsored conservation campaign in America. We are very pleased with that, of course, but we think it underscores just two facts that are relevant here. First, the American people are going to respond dramatically to the President's community tree planting initiative. I think we have demonstrated that. They have already started into action. We want the president's initiative to help underwrite and fund the kind of technical assistance at the State and local level that these people need, because the difference between just doing it and doing it right is significant.

It is important that we not go through this effort and energy and public excitement and do things that are not technically adequate. The way you get tree programs that are technically adequate is have the people there, service foresters, educators and others—both from the private and public sector—who can help.

The second point we want to make is that while this positive environmental initiative can absorb a great deal of money both from an expanded Federal program and from the support of private corporations and businesses and individuals, we must build the citizens' component at the same speed and rate as we build the financial support. We cannot just pour money on this kind of an effort.

Our goal is to encourage Americans to take charge of those community environments, to do it themselves. We have built what we have today on the civic and national pride that makes people want to get out and make their town and neighborhood a place where they are glad and proud to live. That is going to demand that USDA administer this new program in a way that does not replace citizen energy with Government money. Rather, they need to take advantage of the existing institutional framework, in both the public and private sectors, and build them simultaneously. These programs need to grow at a measured pace, and not try to start too much, too soon.

We are really pleased that President Bush has taken this leadership, Mr. Chairman. We hope you will help his administration design a program consistent with the total needs of the forestry community. We are glad to offer our efforts and our cooperation and the campaign that we call Global ReLeaf. We think this gives him a running start. We have attached some addendums we would appreciate making part of the record. We appreciate the chance to be here today.

Senator FOWLER. They will be. Thank you. Thank you, Mr. Sampson. And also I would like to include for the record the statement of Mr. Fischer who could not be with us this afternoon.

[The prepared statements of Mr. Sampson and Mr. Fischer follow:]

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TESTIMONY
Presented to

THE SENATE COMMITTEE ON AGRICULTURE SUBCOMMITTEE ON CONSERVATION AND FORESTRY
on
URBAN AND COMMUNITY FORESTRY

R. Neil Sampson
March 1, 1990

Mr. Chairman. Members of the Subcommittee.

I am Neil Sampson, Executive Vice President of the American Forestry Association. Our Association is the nation's oldest citizens conservation organization, promoting tree and forest conservation and wise forest management for over a century. We are pleased to share some views with you today about the needs of the urban and community forests in America.

The community forests of America represent a huge, exceedingly valuable, living resource. Like forests everywhere, however, these forests will provide the greatest stream of economic and environmental benefits to people when they are properly managed and cared for. Unfortunately, the evidence is strong that they have not been adequately managed.

We estimate that urban and community forests cover some 70 million acres of incorporated municipal property, and a large but unknown area of unincorporated, but developed, acreage. The most recent estimates from the Soil Conservation Service indicate that this "urban and built-up" acreage is increasing at a rate of about 1 million acres each year.

We lack good resource information on this urban and community forest, but we have done some surveys that provide the best data available there. In 1989, with the help of state and city foresters, non-profit organizations, and citizen volunteers, our Association completed a street tree survey of 413 communities across America. This survey was made possible by financial support from the U.S. Forest Service, through the state and private forestry program.

We found some disturbing things. First, about half of the nation's street tree planting spaces are empty -- there is a need to plant over 60 million trees just to fill in the empty spaces, let alone replace the natural mortality that occurs or accomodate urban and community growth. These numbers, I remind you, relate only to street trees, not the community trees on private property, around homes and businesses, or in parks, greenways and other community areas. We estimate street trees to represent something on the order of 10 percent of all community trees.

The lesson, then, is that if there are over 60 million street trees needing to be planted, there are at least 5-10 times that many planting opportunities in America's urban areas. A planting goal of 30 million trees each year, as proposed by President Bush in his America The Beautiful initiative, is within the range of needs as indicated by our best information.

Our survey showed that most of America's street trees were fairly small and young -- indicating that there has been significant planting in recent years, but also pointing out that much of the very important work in the community forest is the care and management of existing trees. Our survey showed 21.6% of the street trees to be less than 3 inches in diameter, while 45.5% were in the 3 to 12-inch range. That means 2/3 of America's street trees are less than 12 inches in diameter. So, in addition to planting new trees to add to this number, we need better community tree care programs that will extend the lifespan and benefits from the 60 million existing street trees.

The United States has the technical expertise and the institutional framework to provide significant improvements in both community tree planting and tree care programs. The Forest Service administers a cooperative urban forestry program in conjunction with state forestry agencies that has improved technical assistance capacity throughout America. This program, while it has been small in the past 10 years, has established an excellent framework of technical capacity, and demonstrated what such a program can accomplish. Both the program and the technical assistance framework, however, is stretched much too thin in most states. More service foresters, specially trained in urban and community forestry techniques, are needed. This is particularly important in meeting the needs of small towns in rural areas, where the community budget for local forestry programs is small or non-existant, and professional staff resources are equally unavailable.

Additional research is also badly needed. Urban trees live in some of the most difficult growing conditions imaginable, and more needs to be known about species adaptation and management under adverse urban conditions. In addition, research in urban design is needed so that urban planners, designers, and managers know how to develop a community that can support a thriving urban forest.

The past ten years has also seen the development of a tremendous network of non-profit organizations, private citizens groups, and local conservation leaders that are both interested and active in improving community forests. Much of this work has been accomplished by the American Forestry Association, working in cooperation with the Forest Service, State Foresters, and a wide variety of other federal, state, local and private entities through the National Urban Forest Council -- a group that has been in existence for 8 years to promote better understanding of urban and community forest issues.

The limiting factor in harnessing more citizen action, as well as community action in small cities and towns, is often money. Private citizens groups can provide the energy, but not the necessary cash, to plant trees, monitor forest conditions, and provide improved tree care programs. Town budgets are often too strapped to undertake the initial planting investments, and may need cost-sharing help to address the important need for improved long-term management programs, as well.

This is where the President's proposal for an "America the Beautiful" initiative can be, in our view, the most helpful. This proposal would direct $175 million to a new emphasis on tree planting and forest improvement, $65 million of which would be aimed at urban and community forest improvement. Much of this is intended to strengthen the existing technical assistance program to communities, and there are plans for community cost-sharing programs as well.

This is a program that will be strongly supported by a wide variety of individuals, corporations, and organizations across America, and that can result in changes in this nation's forests that will have positive environmental and economic impacts throughout the 21st Century. It can strengthen the technical assistance framework, making it available to a wider array of communities and community groups. It can help provide grants to communities and local non-profits so that tree planting and care programs can proceed.

The proposal picks up the theme that our Association has been promoting since 1988 as part of our Global ReLeaf campaign. In light of the uncertainties associated with the global environment, as evidenced by the scientific concern over the "greenhouse effect" and the potential for significant, and damaging, changes in global climate, we feel that it is time to begin action. Happily, there are actions we can take right now that can be truly positive and beneficial. Planting trees and improving forest growth is the most cost-effective, easiest, and obvious.

We learned in grade school biology that trees take up carbon dioxide, convert it to organic compounds, largely biomass, and give off oxygen as a byproduct. Today, having more forests taking up and storing more carbon dioxide, is an important element in re-stabilizing global environments and climates. Thrifty growing trees use CO_2 at the rate of about 26 pounds per year -- approximately 5 tons per acre per year.

Around our homes and small businesses, trees can be a very critical part of the greenhouse solution. Three trees, properly placed, can reduce air conditioning costs by 10 to 50 percent. This not only saves the homeowner or businessman real dollars in the short term, it reduces the peak demands for electricity, which translates into less energy demand, lower amounts of fuel burned, and reduced air pollution and carbon dioxide loadings. Thus, the "community trees" element proposed in the America the Beautiful initiative is a very important part of the whole picture.

In 1989, Mr. Chairman, as a direct result of the Global ReLeaf citizen education, private-sector fundraising, and community organizing, there were Global ReLeaf campaigns started in every state, and in thousands of communities. Fourteen states have developed a formal state Global ReLeaf program, as have 120 communities, and the number grows each week. The state forestry agencies have pitched in by designating a Global ReLeaf State Coordinator in every state, and we have over 150 cooperating private non-profit organizations who are dedicating their programs at the local level to tree planting and forest improvement.

On the private sector front, we are working with nearly 50 business and industry firms, many of whom are in the Fortune 500 list, to develop national tree planting and educational campaigns. Last year, for example, Amway Corporation distributed trees to its distributors, who in turn sponsored local tree planting and educational programs in many communities. The Winery of Ernest and Julio Gallo provided funds that supported public-private partnerships in 11 cities across the nation. One such campaign planted 300 trees along Martin

Luther King Avenue in Los Angeles just this past month. The Davey Tree Expert Company of Kent, Ohio, is promoting Global ReLeaf through all its business locations across America.

In the spring of 1990, a number of new corporate campaigns will have tremendous impact in America's communities. McDonald's will be testing an environmental education and seedling distribution program in 9 cities. If successful, that campaign could be nationwide in 1991, distributing 8 million seedling trees as part of a major national educational campaign. Texaco will focus efforts on three cities -- Denver, Houston, and New Orleans -- testing a major tree improvement effort in each city that involves local government, local non-profit organizations, Texaco employees, and the general public. If those are successful, other cities will be added to the program list. Dayton-Hudson will be advertising Global ReLeaf and giving away trees in 29 major Midwestern markets, and the Rouse Company will be doing likewise at a number of their large shopping malls. Other companies, with a wide variety of products, will be promoting the Global ReLeaf idea as part of their advertising and marketing campaigns.

These campaigns, and others like them, have made Global ReLeaf the fastest-growing, most widely-noticed conservation program in America today, Mr. Chairman. We think our experience with it underscores two facts.

First, the American people will respond dramatically to the President's Community Tree Planting initiative. They already have swung into action -- the President's Initiative will help the federal and state agencies catch up with them.

Second, while this positive environmental initiative can absorb a great deal of money -- both from an expanded federal program and from the support of private corporations, businesses and individuals -- we must work hard to build the local citizen's component as fast or faster than we expand the program. Our goal is to encourage Americans to "take charge" of their own environment again, to rebuild the kind of civic and national pride that makes towns and neighborhoods a place where people are glad -- and proud -- to live. That will demand a program that does not replace citizen energy with government energy, but which uses the leadership inherent in government to call citizens to new action. We are convinced that the America The Beautiful has this potential, if it is designed and carried out with existing federal and state institutions, working cooperatively with the very large and eager non-profit conservation community that has grown up around America's community forests in recent years.

We are pleased to see President Bush provide the leadership on this issue that the America The Beautiful program represents. We're eager to play whatever role we can in helping that effort succeed. We think our Global ReLeaf campaign provides both a working model, and a "running start" at achieving the President's goals. We're hopeful that the Congress will respond with positive legislative and budget support so that the essential federal assistance needed in this effort can be realized.

AMERICAN FORESTRY ASSOCIATION – 1990

COMMUNITY FORESTS GET A CHECK UP

The American Forestry Association (AFA) has a century long reputation of looking after the forests of this country and giving periodic reports on their condition. The November 1989 issue of AMERICAN FORESTS magazine gives a comprehensive overview for the '80s called "The State of Our Forests" and includes an analysis of our urban forests. During this decade the National Urban Forest Council, which is housed at AFA, has pursued all opportunities to improve our knowledge of community forests. This is a report on what we know.

The Council completed a survey of the street trees in 320 communities across the country in late October, 1989. Dr. James Kielbaso of Michigan State University evaluated the data as leader of the Council Committee that organized the survey. Other key players in completing the survey were the U.S. Forest Service, the state forestry agencies, and the American Forestry Association. Communities were selected using a random sample method which allowed survey teams to visit 320 communities in 29 states, supplying the most comprehensive database yet compiled.

The survey shows urban forests are starving for trees; less than half of the 124 million planting spaces along our streets are occupied (see Figure 1). Every available site is important because so much of the community forest area is limited by streets, sidewalks, and buildings. We need to fill every space with trees in order to produce a true forest canopy.

NATIONAL STREET TREE SURVEY
SUMMARY REPORT

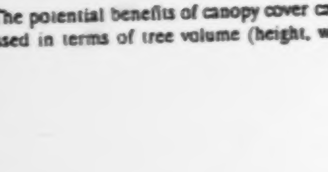


Figure 1.

The potential benefits of canopy cover can be discussed in terms of tree volume (height, width, and depth); large volume trees obviously have a much greater impact on the urban environment than smaller ones. Trees cool the environment, add moisture, and improve the air while the manmade surfaces heat it up, dry it out, and intensify air and water pollution factors. Large trees help to balance the ratio of leaf surface to concrete, steel, and asphalt. Unfortunately, the survey data indicates our streets are not only understocked, but are dominated by small and young trees (see Figure 2).

NATIONAL STREET TREE SURVEY
TREE SIZE DISTRIBUTION

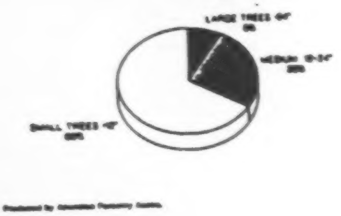


Figure 2.

Only 8-percent of the 93,000 trees sampled in the national survey were large trees over 24 inches in diameter; more than 66-percent were young or newly planted. With fully two-thirds of street trees being small, the environmental impact is very low compared to the potential. All forests should have a balanced mix of small, medium, and large trees, and when the mix is out of balance to the extent this survey indicates, action needs to be taken. We need to plant large trees and spend more money to maintain the older trees we have.

The new survey information is also helping us to understand the rest of the forest. Like the proverbial trial balloon it is being used to test conditions and make other assumptions. For example, we now have estimates on the size of the total urban forest based on the street tree count of 59 million trees. For every tree on the street, however, there are at least 10 more in parks and on private lots (see Figure 3); (some estimates go as high as 15 to one). Using the conservative end of this measure, the national urban forest weighs in at approximately 600 million trees.

Figure 3.

In 1987, Kielbaso and Moll estimated the value of street trees in the country at $25 billion based on a method established by the Council of Tree and Landscape Appraisers. Using the multiplier of 10, to convert street trees to the entire urban forest, places the value at $250 billion. This is a large figure but one we feel is probably way below the mark.

In recent years, estimates of the value of urban forests have explored various methods of calculation based on ecological and environmental factors. These estimates suggest an even higher measurement. As our knowledge of ecology increases, so do the estimates. Take energy, for example. In the early '80s, a number of researchers estimated the cooling value of trees based largely on the shading effects on a single building. But research by Akbari, Rosenfeld, and Parker--published in 1988--indicates that the cooling effect is much higher than expected when the figures are extended beyond a single home to an entire city.

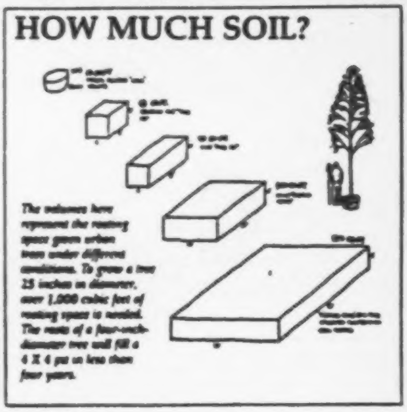
Increased city temperatures--the so-called urban heat island--are major contributors to global warming. Each increase in urban temperatures nationally costs $1 million per hour/per degree of increase. This was a figure well beyond what urban forest researchers conceived of just four years ago. Add other environmental factors such as stormwater management, sediment and erosion control, air pollution, and wildlife habitat, and the value of the nation's urban forests far exceeds the $250 billion estimate derived above.

While measurements of value climb, the quality of the urban forest does not. Urban forests are commonly divided into three types of areas corresponding to three zones: downtown (central business districts), urban residential, and suburban residential. Growing conditions differ greatly in each of these areas because of environmental stress and restrictions on space.

Air pollution, heat reflecting off concrete and glass, oil, salt, and other pollutants from sidewalks and streets all add varying levels of stress. So does the space available. Limited planting space, especially underground space, is probably the major factor in premature death. A too-small pit in a downtown sidewalk will usually put a strangle-hold on the roots that will kill a tree slowly, but effectively.

James Urban, a landscape architect from Annapolis, MD, and winner of the 1989 Professional Award in Urban Forestry, is conducting a study of trees in downtown planting pits for the National Endowment for the Arts. So far, he has reviewed the planting history of 1,200 trees, and measured the growth rates and survival histories.

Urban has determined that tree health and growth rates are related to the size of the planting space. When the soil in the planting pit is less than 300 cubic feet, the survival rate of the tree starts to decline and continues steadily as the pit size decreases (see Figure 4). Soil pits of 100 cubic feet or less are severely restrictive to tree growth and survival. Since most downtown planting pits are somewhere in the 100-cubic-foot range or less, the short lifespans measured in past surveys are not surprising. If we want larger and



The volumes here represent the rooting space given urban trees under different conditions. To grow a tree 25 inches in diameter, over 1,000 cubic feet of rooting space is needed. The roots of a four-inch-diameter tree will fill a 4 X 4 pit in less than four years.

Figure 4.

healthier trees, we will need bigger and better planting spaces.

A noticeable improvement in tree health occurs progressively from downtown to the suburbs. Average lifespans increase from about seven years for a downtown tree to an average of 32 years for a suburban tree (see Figure 5). Suburban yards contain more room for growth, temperature extremes are more moderate, air is less polluted, and runoff from streets and sidewalks is cleaner.

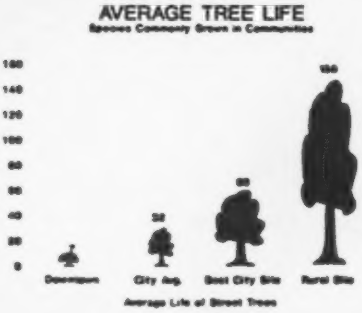


Figure 5.

Differences in tree health also seem to correspond to the size of communities. The larger the city, the less healthy is its forest. In 1986 the National Urban Forest Council surveyed 20 large cities and discovered the shocking reality that four city trees are dying or have died for every one tree planted (See AMERICAN FORESTS, June 1986). The largest cities surveyed, which included New York and Chicago, were losing twice that many, while medium-sized cities were doing much better.

Today, the national survey has discovered an improvement in the planting/removal ratio. Urban tree managers indicate they are planting many more trees today. However, even at par it will take 247 years to fill the empty spaces along our streets. On average there's .386 street trees per person. Kielbaso believes the goal should be 1 per person.

Recent concerns over global warming and air pollution are now beginning to focus interest--locally and nationally--on our urban forests. AFA, with Global ReLeaf and its corporate sponsors, has led the effort to put city trees on the national agenda and has worked with hundreds of community groups around the country to raise local consciousness. The results of this new survey, introduced at the Fourth Urban Forestry Conference in St. Louis by its principal investigator, Jim Kielbaso, gives us a timely snapshot of the overall condition of the urban forest at the end of the '80s and should help communities to build support for urban forestry programs and gain ground in the battle of local budget priorities.

AFA's Global ReLeaf program has set a goal for dramatically increasing the number of trees planted in cities. We are calling for 100 million new urban trees by 1992, which will represent a 15-to 20-percent increase in community trees. This goal has caught the attention and fired the hopes of many Americans. That was our first objective. But we here at the AFA have another goal as well, and that is to change the ecology of our cities by building bigger and healthier urban forests. The measure of our success will be revealed in how thick the canopy of tomorrow's forest is, and how large the trees have become.

Working for the Nature of Tomorrow®

NATIONAL WILDLIFE FEDERATION

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TESTIMONY BEFORE THE U.S. SENATE
COMMITTEE ON AGRICULTURE, NUTRITION, AND FORESTRY
SUBCOMMITTEE ON CONSERVATION AND FORESTRY
WASHINGTON, D.C.

PRESENTED BY R. MONTGOMERY FISCHER
NEW ENGLAND REGIONAL EXECUTIVE
NATIONAL WILDLIFE FEDERATION

MARCH 1, 1990

Printed on Recycled Paper

Mr. Chairman and members of the subcommittee, my name is Monty Fischer, New England Regional Executive for the National Wildlife Federation. It is an honor to be able to provide testimony to you today on the important topic of stewardship of our country's forest resources.

The National Wildlife Federation is the nation's largest conservation/education organization, with over 5.6 million members and supporters in 52 states and territories. We have a deep and abiding interest in the sound management of the forest lands of this nation.

There are three principal points that I would like to make concerning forest stewardship and opportunities in the 1990 Farm bill:

* A stronger and more effective working relationship needs to be established among private, state and federal interests directly involved with forest resource management, especially in the context of formulating and adopting new national goals and policies for all forest lands.

* Private landowners should be given the educational tools to understand the need to prepare forest plans to guide the sound environmental and economic management of their holdings.

- In certain instances, financial incentives should be made available to private landowners to assure well-managed forest lands and important forest lands with special environmental or economic characteristics are maintained as such.

A great deal of attention has recently been focused on the President's proposed tree planting initiative. Although we support tree planting as a tool to restore or improve environmental conditions, tree planting efforts must be part of our overall program of forest stewardship. The 1990 Farm Bill offers an excellent opportunity to emphasize increased stewardship of our nation's forest lands.

In preparing for today's session, I thought back to my days as a maple syrup producer in Sugarbush, Vermont. I thought of the care we took to carefully manage our sugar maples in a stand which had been continuously producing for nearly a century. And I thought of the seasonal second homes which now occupy that formerly productive forest. My problem was that my partner and I could only lease the land and trees; an out-of-stater was simply holding onto the 500 acres until the capital gains tax situation reached a point that was to his economic advantage to sell. It was then that we lost our lease and he sold the land for development.

Although we were good stewards of the land, it was difficult for us to get consistently reliable and timely technical information on the best forestry management practices. There were also few, if any, incentives for the out-of-state owner to be an informed forest manager while keeping his land producing economically-viable products such as maple syrup and firewood. By selling the land for development, he also closed off a traditional hunting area for small game and deer, a factor of little weight in his decision to sell, but an important loss to those who had enjoyed access to the land for many years.

All this might have been avoided if two factors had come into play. First, there needed to be better information on how to manage the forest resource on his 500 acres, and the ready ability to work with federal and state officials to develop a long-term plan for his land. Second, there needed to be an economic incentive to offset the intense development pressure to change the traditional use of his land.

This example is just one illustration of situations which are played out countless times every year in New England. The recently-conducted Northern Forest Lands study, about which I know you have knowledge, points out some very dramatic trends which are clear to professional and lay citizens alike.

Not only are small, private woodlot owners under pressure to convert their lands to other non-forest base uses, but larger, corporate entities are facing much the same dilemma.

One aspect of this study was the completion in January, 1990, of an attitudinal survey of residents within the study boundaries in New Hampshire and Vermont. Quoting from the introduction provides a clear summary of the existing situation.

"New Hampshire and Vermont's northernmost counties, like those in New York and Maine, are heavily reliant on natural resources for their economic base. For many decades, land ownership and residence have been stable. Several large landholders, often represented by companies headquartered outside the region, have practiced consistent land-use patterns, primarily timber extraction. In sparsely populated communities, residents have experienced high unemployment and limited opportunity. For many decades the relationship between several large landowners and the citizens of this region has remained relatively stable. Recently, however, we have seen the beginnings of a dramatic change in ownership of the larger landholdings in the region. For residents there, this change in ownership portends a change in traditional access to land-based economic and recreational opportunities.

"Residents of the area have enjoyed virtually unlimited access to the vast tracts of forest land owned by paper and logging corporations. The road network supplied by these owners provides access for a variety of outdoor recreational activities. The importance of these activities cannot be overemphasized in light of the sparsely populated, rural character of the region.

"These recreational amenities have begun to attract increased numbers of vacationers and retirees from the large metropolitan areas within several hours commute. Numerous seasonal camps and settlements have undergone a protracted period of expansion and conversion to year-round homes. The area is increasingly becoming a location for time-sharing condominiums. As a result of these activities, real estate values are rising, especially for land with river, pond, and/or lake frontage.

"Within the prevailing economic climate, timber holding companies are reevaluating their long-term holding strategies. In an economy driven by short-term efforts to maximize on investment, the traditional patient, long-term view associated with forest land holdings is no longer the norm. Instead, the short-term real estate value of the land supersedes its natural resource value. Diamond Occidental forest land sales of more than 400,000 acres in 1988 in the Northern Forests Lands area confirmed the fears of timber industry observers. Since then, threats to change the nature of the region with its large and endangered timber company holdings have attracted state and federal attention."

Here then is the second example which illustrates the basic three points of this presentation. With the breakup of large forest land holdings, yet another disparate group of forest landowners will appear throughout the region. Every effort must be made to provide them with educational material and other incentives to assure that their forest land ownership and management respects the inherent values and characteristics which promote good stewardship. There will be many new owners in the years ahead, many of whom will take control of less than 100 acres of forest land. In sum, small landowners likely will represent a substantial portion of the land controlled, and therefore will have a significant impact on the 26 million acres of forests of northern New England and New York. As a note, there are many excellent examples of these land ownership changes included in the draft Northern Forest Lands Study Report (1989).

The broad context in which more active participation by the private forest landowner should occur is the preparation and adoption of national goals and policies for forest land management. The role of federal forest management responsibilities has generally been concentrated on our national forests, a situation which is most proper. However, as society's knowledge and understanding of the appropriateness of and need for integrated management systems increases, the responsibility of the federal government to actively assume a broader role becomes more apparent. The Forest Service must be encouraged to work the states and private forest landowners to address the management of the nation's forest resources as a whole.

Beyond the formulation and implementaion of national goals, financial incentives ought to be considered for forest landowners in specific cases. Under very specific criteria, which might well differ from state to state, some form of matching financial assistance to prepare management plans on private lands makes sense from an economic and environmental standpoint. Whether it be highly productive or unique timber sites, clearly valuable fish and wildlife habitat, recreational opportunities, or other criteria, the process of identification and management is paramount, and in the national interest. The key is to create every possible incentive to evaluate forest lands for their best uses, or for their protection. If in fact it is decided by a duly recognized review committee, however constituted, that certain portions of a private forest landowner's parcel ought to be protected, then a mutually-understood and voluntary agreement could be developed, and appropriate compensation provided by the federal government.

In conclusion, the opportunities and ability to move ahead on better management of private forest lands has never been better.

The National Wildlife Federation, with its 5.6 million members and supporters, is ready to work on this issue and support Congressional initiatives to address this issue in the development of the 1990 Farm Bill.

Thank you, Mr. Chairman and members of the Subcommittee, for allowing me to testify today on behalf of the National Wildlife Federation.

Senator **Fowler**. And I think as we heard this morning that we are having this hearing at the right time because I think the administration needs the help, certainly with the private forestry. I want to commend all three of you, all of our witnesses, but especially the three of you. We have so much attention, and I have to keep my eye on the public forests myself. But if we are not careful, we are guilty of overzealous protection of tree removal from the public lands at the exclusion of the stewardship programs and private initiatives that will increase private timber management and planning on our private lands. And that is where this growth has got to, it seems to me, has got to come from.

So I commend you. I missed my breakfast this morning because something happened. And mid-morning on clean air. I went out to lunch, and we had a vote just as soon as I got down there to order my soup, and this is another vote. So we are a little snake-bit here today. There are a lot of questions I would like to discuss with you, but we better end it while the getting is good. But I would solicit from the three of you particularly who heard the administration's sketch this morning, and I am not being critical, but I think it can honestly not be called more than a sketch, I hope, I believe that they are serious in working very closely with us in devising this program.

And this is the real opportunity for private foresters, ongoing stewardship programs, the role of the Extension Service in the education and implementation of this program. They need our help. And if we do not offer it with specific proposals, and I would like our subcommittee to be the conduit for those proposals, then I think we have only ourselves to blame of we do not get it off the ground with the kind of community enthusiasm and cooperation and coordination that you have just spoke so well to, Mr. Sampson. I thank everybody.

Mr. **Sampson**. Thank you, Mr. Chairman.

Mr. **Moody**. Thank you, Mr. Chairman.

Mr. **Neal**. Thank you.

[Whereupon, at 3 p.m., the subcommittee recessed, to reconvene at 2:05 p.m., Thursday, March 29, 1990, in room SR-332, Russell Senate Office Building.]

[Material submitted for inclusion in the record follows:]

APPENDIX

POSITION STATEMENT OF THE ASSOCIATION OF CONSULTING FORESTERS OF AMERICA CONCERNING THE FORESTRY STEWARDSHIP PROGRAM

INTRODUCTION

The National Association of State Foresters has recently convinced Congress to establish a new Stewardship Program initiative, which will provide Federal funds to landowners placing their forest lands under stewardship management. The Association of Consulting Foresters objects to an increase in federally provided funding to assist forest landowners, for reasons outlined in this position statement.

CURRENT SITUATION

TYPES OF FOREST LAND OWNERS

There are many types of forest landowners, including nonindustrial private landowners, such as, farmers, people who have inherited land, and individual investors; industrial private landowners, which includes the processors and manufacturers of pulp, paper, and lumber; institutional investors, such as the pension funds; and Federal and State owners. In the South, approximately 70 percent of the forest land base is owned by the nonindustrial private landowner. In the North and West there is a much higher percentage of federally owned lands.

The goals of these landowners differ significantly. Many nonindustrial landowners have a goal of making a satisfactory return on investment. Others use their forest land to protect capital. Many others use their forest land, either primarily or secondarily, as a recreational area, for hunting, fishing, or other outdoor activities.

Industrial landowners have as their goal supplying raw material to their mills. Institutional land owners have as their goal a satisfactory rate of return on their investment.

SERVICE PROVIDERS

There are quite a few groups already in place providing service to the private landowner. These groups include consultants, industrial landowner assistance programs, State aid programs, the State and Private Forestry sector (a division of the U.S. Forest Service), and the American Tree Farm System, among others.

Consultants manage land primarily for nonindustrial landowners. They are paid for their services by the landowners. The consulting business is a growing business, as more and more landowners recognize forest land as an asset that should be managed. They also recognize that the fees charged by consulting foresters are for services rendered in their short and long term interest toward whatever goals they may have. There are adequate capable, reliable consulting foresters available in the United States to carry out the needed work.

Many pulp and paper and saw mill industries have landowner assistance programs. These landowner assistance programs provide aid to private landowners, usually in exchange for a right of first refusal on timber, or some other commitment to provide timber to the company in the future. These programs have as their goal the procurement of wood for their mills, and the encouraging of landowners to reforest and produce wood in the future so that the mills will have a continuing supply of raw material.

Most State forestry agencies have foresters that provide limited management assistance to private landowners. The goal of these agencies is to encourage landowners to practice good forestry, but should not be to carry out services better carried out by the private sector.

The State and Private Forestry branch of the U.S. Forest Service has offices in most States. They provide educational programs and literature to private landowners. The goal of this agency is to encourage private landowners to practice good forestry.

The American Tree Farm System is a national organization that recognizes private forest holdings for practicing good forestry. Their goal is to encourage people to practice good forestry.

GOVERNMENT PROGRAMS AND FORESTRY

Historically, there have been limited government programs in the forestry sector, in strong contrast to those which have existed in agriculture. As a result, the forest economy is a free market. Supply and demand have closely tracked each other, and particularly in the South, prices for the raw materials for mills have remained very stable. This has been a benefit both to the private landowners and to the mills, since they can make projections into the future with reliable figures. This healthy forest economy is in stark contrast to the agricultural economy in the same areas, where government involvement has led to an oversupply of crops, and slow response to supply and demand constraints.

FEDERAL POLICY

A complete lack of consistency in Federal forestry policy is sending a confused signal to private landowners and foresters. On the one hand, Federal tax laws have removed the capital gains differential from timber sale income, treating the capital gains differential for timber the same as other unfair and unneeded tax loopholes. This removal of Capital Gains, along with the elimination of passive loss deductions, has resulted in a disincentive to making a 30 to 100 year reforestation investment. The Federal Government, through its tax laws, has been treating forest investments as though they are a tax loophole.

On the other hand, the Federal Government has planted millions of acres in trees through the Conservation Reserve Program. One justification of the Conservation Reserve Program has been that private landowners aren't replanting enough trees. This failure of private landowners to plant sufficient trees to satisfy the Federal Government is a direct result of private landowners perception that the return is not sufficient from forestry investments. This is, as mentioned above, aggravated by the fact that the Federal Government is putting more tax burden onto forest properties.

AD VALOREM TAXES

In several States, a recent ad valorem tax increase on timber is aggravating the disincentives created by the loss of capital gains.

FORMULATION OF THE STEWARDSHIP PLAN

The Stewardship Plan was formulated by State foresters, and there has been little or no input from the other groups involved.

SUMMARY

In summary, there are many types of landowners. The landowner that will be most affected by the Stewardship Program is the private nonindustrial landowner. Most nonindustrial landowners have a satisfactory rate of return as their goal, independent of the supply of stumpage to mills. Most mills and governments have an adequate supply of cheap raw material from the forest in their area as a goal. The goals of these private landowners is not necessarily the same as those of the local State and industrial groups.

There are already quite a few groups in place to provide service to nonindustrial private landowners.

The fact that there has been a limited number of government programs in forestry has resulted in a free market economy, which is one of the strengths of our current forest economy.

The Federal Government currently has what appears to be a conflicting set of policies toward forestry.

Increases in ad valorem taxes at the State level may further harm forestry.

The current Stewardship Plan was put together by the State foresters, with no input from the affected groups.

ACF POSITION

The ACF supports the concepts of multiple-use management contained in the Forest Stewardship Program.

The ACF supports the concept of involving those that will be affected by government programs in their formulation. As can be seen from the list of those providing services to forest landowners above, there are a lot of groups that will be affected by the proposed legislation that have had no input to the legislation.

The ACF supports the concept of filling needs for services through the private sector wherever possible. There are many free enterprise programs in existence to service the private landowner. The Forest Stewardship Program represents an attempt to replace existing private programs with a Federal program. It is our position that all forestry legislation should be designed to promote free enterprise, to avoid the disaster that has occurred in the Government agricultural programs.

The ACF supports the role of government as an educator. As can be seen by the myriad of conflicting laws concerning forestry at the State and Federal levels, government has failed in its attempt to educate itself, much less the private landowners the Stewardship Program targets. It is our position that the government effort should be directed toward, and concentrated in, education of private landowners. The government should also encourage forest management through changes in the onerous and increasing tax burdens placed on forested properties.

POSITION STATEMENT OF THE SOCIETY OF AMERICAN FORESTERS, PRINCIPLES FOR FOREST AND RELATED CONSERVATION PROVISIONS OF THE 1990 FARM BILL AND RELATED MEASURES [6]

INTRODUCTION

The Food Security Act of 1985 included the Conservation Reserve Program and other provisions aimed at soil and water conservation. Pending 1990 farm bill legislation will offer opportunities to develop these programs further, as well as to integrate them with related proposals for planting trees and improving forest management. Most notable among these proposals is the President's "America the Beautiful" tree-planting initiative. Other proposals would encourage the planting of hardwoods. The following comments are presented to encourage the successful design and integration of conservation provisions of the 1990 agricultural legislation to increase their multiple-use benefits.

CHANGES TO THE CONSERVATION RESERVE PROGRAM

The current Conservation Reserve Program (CRP) is authorized to protect 40 to 45 million acres of cropland from soil erosion for periods of up to 15 years (although contracts are being limited to 10 years). The success of the CRP has led to support for proposals to extend its eligibility criteria, duration, size, and signup period.

BROADER ELIGIBILITY CRITERIA

In general, society benefits most when lands can be used in ways that serve multiple purposes. Existing eligibility for CRP hinges on the erodibility of land. Many new proposals would extend eligibility criteria to increase protection of surface water, ground water, and wetlands. Other purposes that are also being served by CRP and that could be served more with careful management include upland wildlife habitat, carbon storage to combat the "green-house effect", food and fiber production, and recreation (including trails and scenery).

Many of these purposes are now served to some extent by CRP while protecting soil and water. To the extent that they can be served more, technical assistance and cost-sharing of practices should encourage the broadest possible benefits that can be produced by the CRP. Cases where this could occur include windbreaks, shelterbelts, filter strips, and other forest resource management and conservation practices.

To the extent that these purposes involve local problems, opportunities, and expertise, CRP eligibility requirements are and should be determined and coordinated at the State level by the existing State CRP Review Committees. Such review should facilitate coordination with section 319 nonpoint water pollution control plans, watershed plans, Resource Conservation and Development plans, State fish and wildlife plans, State outdoor recreation plans, and statewide forest resource plans. This would constitute a higher degree of coordination than is currently being achieved. To the extent that the responsibility and authority for eligibility criteria rest with the States, CRP rental payments could be cost-shared with State and local agencies and organizations, creating a "State CRP".

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[6] Adopted by the Officers of the Society of the Society of American Foresters on March 7, 1990. This position will expire in one year unless, after thorough review, its continuance is approved by the Council of the Society of the American Foresters.

DURATION OF CONTRACTS

Current CRP contracts will begin to expire in 1996, at which time many acres will return to crop use and, probably, lesser degrees of conservation. If many of the most sensitive of these acres are to remain protected, CRP contracts will need to be extended by rolling-over existing contracts with extension agreements (including the possibility of permanent status). In addition, flexibility should exist for longer (including permanent) contracts for future CRP signups. These measures might use stricter eligibility criteria and could be applied on the State CRP. The possibility of extending contracts before they are about to expire would relieve uncertainty for both contracting parties. Permanent rentals should have the option of one-time lump-sum payments.

SIZE OF THE RESERVE

The administration's farm bill proposal would limit the CRP cap to the currently authorized 40 million acre minimum; others would like to see a higher cap. One alternative would be to limit the direct Federal program to this lower limit and to allow an additional 5 million acres of more flexible inclusions (up to the current cap of 45 million acres) via the State CRP; the State CRP would not unduly restrict cropland use if it were not required to come from existing cropland. This two-cap principle still could be used if higher caps were to be chosen.

SIGNUP PERIOD

The signup period will probably need to be extended beyond 1990 to meet any foreseeably chosen CRP goal. To get the best return from the remaining acres to be included, future signups should wait until current issues of eligibility, duration, and size are resolved.

THE AMERICA THE BEAUTIFUL TREE-PLANTING INITIATIVE

The administration's "America the Beautiful" (ATB) rural tree-planting initiative is clearly welcome as compatible with the purposes of many forestry programs that have been proposed for adoption or expansion for some time. Because realization of the full benefits of such an initiative depends on the sustained management of forests, "ATB" should take advantage of the years of experience embodied in the design and staffing of existing programs, and it should build upon this experience in innovative ways, including Renewable Resource Extension, ACP, FIP, and perhaps, the originally proposed Forest Stewardship program. By integration with these and other programs, ATB could help to meet the original 5 million acre CRP tree-planting goal in ways that would provide significant soil and water conservation benefits, among others.

SPECIES PREFERENCES

Several proposals for the 1990 farm bill suggest increased cost shares and other incentives to favor the planting of hardwood tree species. These proposals are based on the beliefs that hardwood tree planting requires higher cost shares than other conservation practices, that hardwoods provide better wildlife habitat than softwoods, and that current programs unduly favor softwood tree species.

Public programs should not become encumbered by competing preferences for hardwoods versus softwoods. Programs that serve public multiple-use goals should provide flexibility for landowners to meet their own objectives consistent with land and species capabilities.

ABOUT THE SOCIETY

The Society of American Foresters, with about 20,000 members, is the national organization representing all segments of the forestry profession of the United States including public and private practitioners, researchers, administrators, educators, and forestry students. The Society was established in 1900 by Gifford Pinchot and six other pioneer foresters.

Objectives of the Society are to advance the science, technology, education, and practice of professional forestry in America and to use the knowledge and skills of the profession to benefit society. Members subscribe to a code of professional ethics.

The Society is the accreditation authority for professional forestry education in the United States. Its periodicals are the *Journal of Forestry,* the quarterlies, *Forest Science, Southern Journal of Applied Forestry, Northern Journal of Applied Forestry, Western Journal of Applied Forestry,* and the annual *Proceedings* of the SAF national convention.

PREPARATION FOR THE 1990 FARM BILL

Conservation Issues

THURSDAY, MARCH 29, 1990

U.S. Senate,
Subcommittee on Conservation and Forestry of the
Committee on Agriculture, Nutrition, and Forestry,
Washington, DC.

The subcommittee met, pursuant to notice, at 2:05 p.m., in room SR-332, Russell Senate Office Building, Hon. Wyche Fowler, Jr. (chairman of the subcommittee) presiding.

Present or submitting a statement: Senators Leahy, Fowler, Conrad, Kerrey, Bond, and Gorton.

STATEMENT OF HON. WYCHE FOWLER, JR., A U.S. SENATOR FROM GEORGIA

Senator **Fowler**. Ladies and gentlemen, welcome to the Subcommittee on Conservation and Forestry of our Committee on Agriculture, Nutrition, and Forestry. This is a hearing on conservation in the 1990 farm bill. I have a statement, but I think I will just put it in the record. As many of you know, we have, as usual, a lot going on today, and we will be interrupted around 3 o'clock for a vote. So if I could ask my other colleagues if they would withhold their statements until maybe a little later in the hearing, without objection, I think we will go right to our panel.

[The prepared statement of Senator Fowler follows:]

Prepared Statement of Hon. Wyche Fowler, Jr., a U.S. Senator From Georgia

We need a close examination of conservation practices in American agriculture—for the sake of the future productivity of our farmland. We must conserve the natural resources that we have been blessed with that have allowed us to become the world leader in agriculture.

We must also remember that conservation practices on our farms are an important component of our overall stewardship of our environment.

When we think about the state of our environment—as in the current Clean Air debates—we are all too often prone to focus exclusively on manufacturing, transportation, and utilities. But the soundness of our agricultural practices also has a major bearing on the health of our planet.

Agriculture is our largest source of nonpoint water pollution in this country. Overly intensive agriculture, without proper consideration for conserving natural resources, resulted in totally unacceptable levels of soil erosion in the 1970's.

Other countries adopted the same practices, based on our ebullient advice. In India, to give one example, the long term consequence has been severe degradation of over 40 percent of that country's topsoil.

A similar dismissal of conservation concerns has been a major contributor to tropical deforestation in Central and South America, as rain forests have been cleared to make way for agricultural production that is marginal at best.

Agricultural conversion is also the main reason that our own wetlands have shrunk from over 200 million acres to less than 90 million since the Thirteen Colonies were established. I do not know why it has taken us 300 years to realize that these fisheries, wildlife habitats, water purifiers and storage areas are essential to our environment and our economy. But there is no doubt that it is time to reverse this process and begin the restoration of wetlands.

People everywhere are becoming more and more aware of the intricate balance of our world ecology—and that's a start. As the U.S. Congress develops policies to conserve our natural resources and sustain our food supply, we must consider the role of agriculture in maintaining—or, as the case may be—in undermining that ecological balance.

That is why the conservation title will be, and deserves to be, one of the salient issues of the 1990 farm bill.

Senator BOND. I can take a hint.

Senator KASTEN. May I make a very brief statement, Mr. Chairman? I came to testify, not to be a member of your panel.

Senator FOWLER. I see. Well, we will hear your testimony. We are pleased to have Senator Kasten and Senator Grassley, who are not members of the committee.

Senator GRASSLEY. As I indicated to you, I did not come to make a statement.

Senator FOWLER. We will proceed, Mr. Kasten, and then if Senator Bond wants to make his statement at this time, he is certainly welcome to do so.

Senator KASTEN. You are a member of the committee, Kit. So if you want to go ahead.

STATEMENT OF HON. CHRISTOPHER S. "KIT" BOND, A U.S. SENATOR FROM MISSOURI

Senator BOND. I will submit the bulk of my statement for the record, Mr. Chairman.

I was just going to note that we came across a USDA press release dated June 28, 1985, from John Block saying he was proposing a 20-million acre conservation reserve and what a great stride 20 million acres seemed to be then.

We have lots of problems that I will set forth in my statement. We are very proud that conservation is a top agenda item in the consideration of the farm bill as well as in the actual operation of the agricultural programs.

We have been very interested in conservation in Missouri for many years because our soil erosion loss has been high. We think it is extremely important that we balance environmental goals with economic realities.

One farmer in Missouri was denied $37,000 in farm program payments because 1 bushel of wheat was seeded as a cover crop on a 6 acre wetland. Now while we commend ASCS for being able to spot the 1 bushel of wheat on a 6 acre tract, I am concerned about the severity of the punishment, and I think that those are some of the things that we need to address. As you know, we have introduced a conservation bill called the ACRE proposal.[7] We will look forward to working with you, Mr. Chairman, on these very important conservation issues, and I will submit the full statement for the record.

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[7] S. 2302, Agricultural Conservation Reserve and Enhancement Act of 1990, was introduced on March 20, 1990, and some provisions were included in S. 2830.

Senator FOWLER. Thank you, Senator Bond. Senator Kasten.
[The prepared statement of Senator Bond follows:]

PREPARED STATEMENT OF HON. CHRISTOPHER S. "KIT" BOND, A U.S. SENATOR FROM MISSOURI

This afternoon's hearing comes at a time when conservation issues are once again becoming a focal point in our farm bill deliberations. I welcome the opportunity to hear from a diverse group of witnesses who, while they may share the same conservation goals, may differ on the process.

Mr. Chairman, maybe we need to stop and consider the gains we are making with the implementation of the Food Security Act of 1985. Although I did not share in the fun of drafting this bill, it is interesting to look back at some of the highpoints. For example, this is a USDA press release dated June 28, 1985, entitled, "Block Proposes 20-Million Acre Reserve Program." The first sentence reads, "Secretary of Agriculture John R. Block today proposed the largest single soil conservation program in history of American agriculture—a 10-year, $11 billion conservation reserve which would take up to 20 million acres of highly erodible cropland out of production."

How far we have come. Today, almost 34 million acres are enrolled in the CRP and USDA is proposing a cap of 40 million acres—twice the level envisioned in 1985. I wonder if, in 1995, we will sit at this table and discuss what type of land will be included in the 80 million acre CRP.

Beyond the fact that the Food Security Act of 1985 was the first farm bill in history to devote an entire title to conservation, I believe it formulated the relationship between production agriculture and the environment. I believe we have laid a solid foundation; *yet as we proceed it is crucial that we balance environmental goals with economic realities.*

Missouri farmers support the goals of current conservation programs. As I meet with farmers, I have been pleased by their commitment to the environment. Yet at the same time, I have been shocked by some of the horror stories. For example, we have a producer in Missouri who has been denied $37,000 in farm program payments because 1 bushel of wheat was seeded as a cover crop on a 6 acre wetland. While it is reassuring to know that ASCS and SCS have the ability to spot 1 bushel of wheat in a 6 acre tract, I am concerned that there seems to be no flexibility within the implementing agencies.

As we proceed with the conservation title of the 1990 farm bill, graduated penalties for swampbuster violations seems to be necessary. In fact, I would submit that such a change should be made retroactive to 1985.

Throughout my terms as Governor, and now Senator, representing a State with significant soil erosion problems, I have a deep interest in conservation issues. I plan to make this title of the farm bill a top priority. Last Tuesday, I introduced the Agricultural Conservation Reserve and Enhancement Act of 1990 (ACRE).

This legislation builds on my belief that we have underestimated the impacts of implementing the conservation provisions of the 1985 farm bill. I get concerned when I see projections that SCS will be some 20,000 staff years short for implementing conservation compliance. ACRE recognizes that much work remains and is designed to improve existing programs.

In short, ACRE requires at least one more signup for highly erodible land in the CRP, authorizes the Secretary to offer CRP contracts with flexible time periods, provides for increased incentives for planting hardwood trees in the CRP, permits some economic uses on CRP land, authorizes an optional bid-back program for the least highly erodible land in the CRP, requires USDA to perform a comprehensive study on options for land post-CRP, looks at graduated penalties for swampbuster violations, requires a multiyear set-asides, and authorizes a new integrated farm planning program.

The next few weeks will undoubtedly bring forth many other proposals. In the end, I remain confident we can pass conservation legislation which we can all support.

STATEMENT OF HON. ROBERT W. KASTEN, JR., A U.S. SENATOR FROM WISCONSIN

Senator KASTEN. Mr. Chairman, thank you, and I appreciate your letting me go out of order here. I have a full statement that I would like to submit for the record.

Senator FOWLER. It shall be done.

Senator KASTEN. Just let me summarize for a moment. I first of all thank you for the opportunity to come before the committee, and I urge you to continue the work Congress began in the Food Security Act of 1985 to bring together our national agricultural policy and national conservation policy. The 1985 farm bill was landmark legislation because it linked together for the very first time public financing of agriculture with conservation requirements. I believe we have to build on these forward-looking concepts, make some course corrections to improve how the 1985 provisions work, and take the next important steps to ensure progressive and responsible stewardship of our precious soil, water, wetland, and wildlife resources. We have to be very clear that the purpose of the conservation title is not to penalize farmers, but it is to promote conservation.

Mr. Chairman, the concept of sustainability has come of age not only for natural resources such as soil, water and wildlife, but for social and economic factors as well.

In areas of social, economic and environmental policy, we must seek goals that will lead to optimum and sustainable results, not maximum short-term production, in many cases, unsustainable production. American wildlife is dependent on American agricultural practices. Most of the wildlife in our Nation lives, breathes and dies on private agricultural land. For example, 74 percent of the wetlands remaining in the lower 48 States are in private, not public, land.

At an even more basic level, the health of both agriculture and wildlife depend in the long-run on soil and water. Where the land or water is poisoned, where ground water or topsoil is being mined, where soil is being torn out, whether vegetation is being stripped, neither wildlife nor agricultural production can enjoy a secure future. I think it is important, and we must all recognize that farmers are the key stewards of our Nation's bounty and that both the farmer and the wildlife depend on effective long-term conservation of soil and water.

I want to talk for just a moment on swampbuster and then I will conclude. According to data collected by the Soil Conservation Service as of January 1990, on about 33 percent of the farms receiving Federal program benefits, over 82,000 acres of wetlands have been converted since 1985. Now if we take and extrapolate those results out to 100 percent, we would be talking about the destruction of nearly 300,000 acres of wetlands since 1985. We pick 1985 because that is when the swampbuster went into effect. I am told that many of these converted wetlands are not being used for agricultural commodity crop production or that they are planted for some years and not planted in other years, depending on the participation of the producer in Federal programs.

In either case, these wetlands are not covered under swampbuster. Yet according to all sources, there are only a handful of producers who have actually had Federal program money withheld. I think we need to make it clear we do not measure swampbuster's effectiveness by the number of violations. But it is clear to me that we have problems with regard to the enforcement of this particular provision. The example that the Senator from Missouri brought up is one side of the problem, but we have significant problems on the other side where we have not been able to demonstrate success in saving and preserving and conserving wetlands in the way it was envisioned in the 1985 farm bill.

Mr. Chairman, I hope that we can also work toward conservation compliance goals. We intended that the standards for soil erosion be such that ensured long-term soil degradation would be prevented and a high level of crop productivity be sustained. Soil Conservation Service approved alternate cropping systems may become the norm in the years ahead and threaten to undermine the Nation's soil conservation goals. I believe that deviations from the standard of the so-called soil loss tolerance concept should be the rare exception, not the rule.

Mr. Chairman, thank you for giving me the opportunity to submit this statement, and as I say, I have submitted the entire statement for the record.

Senator **Fowler**. Thank you, Bob. It shall be included. Appreciate your contribution.

[The prepared statement of Senator Kasten follows:]

PREPARED STATEMENT OF HON. ROBERT W. KASTEN, JR., A U.S. SENATOR FROM WISCONSIN

Mr. Chairman, I thank you for the opportunity to come before the committee today. Nothing in the 1990 farm bill will be more important to the food security of this nation than the conservation provisions that this committee will consider in the weeks ahead. We simply must protect the productive capacity of our farms.

I urge you to continue the work Congress began in 1985 to bring together our national agriculture policy and national conservation policy in the Food Security Act.

The 1985 farm bill was landmark legislation—it linked together, for the very first time, public financing of agriculture with conservation requirements. The highly erodible and wetlands conservation provisions—known as sodbuster and swampbuster—and conservation compliance, required producers who participate in most Federal farm programs to refrain from converting erodible lands and wetlands to commodity crop production.

Accompanying this prohibition was an incentive—the Conservation Reserve Program, by which producers were rewarded for retiring cropland and establishing permanent cover for a 10-year contract period. Another provision was a domestic version of debt-for-nature swaps—providing relief from farm debt in exchange for conservation easements for environmentally sensitive lands.

The 1985 farm bill is a good foundation to build on—and that is precisely what we have to do with the 1990 farm bill.

We need to build on these forward-looking concepts—make some course corrections to improve how the 1985 provisions work—and take the next important steps to ensure progressive and responsible stewardship of our precious soil, water, wetland and wildlife resources. We must be very clear that the purpose of the conservation title is not to penalize farmers, but to promote conservation.

Mr. Chairman, the concept of *sustainability* has come of age, not only for natural resources such as soil, water and wildlife, but for social and economic factors as well. In all areas of social, economic and environmental policy, we must seek goals that will lead to optimum and sustainable results, *not maximum short-term production.*

American wildlife is dependent on American agricultural practices. Most of the wildlife in our nation lives, breeds, and dies on private agricultural lands. At an even more basic level, the health of both agriculture and wildlife depend in the long run on soil and water. Where the land or water is poisoned, where ground water or topsoil is being mined, where soil is being worn out, where vegetation is stripped, *neither wildlife nor agricultural production can enjoy a secure future.*

We must all recognize that *farmers* are the key stewards of our nation's bounty, and that both the farmer and wildlife depend on the effective long term conservation of soil and water.

We in the Congress can help improve the stewardship of natural resources on our private agricultural lands. But we can only achieve this goal by providing an economic climate that encourages and rewards good stewardship, and by providing the solid information and assistance farmers need if they're going to make sound decisions about their soil, water, wetlands and wildlife over which they exercise stewardship.

First, not every conservation provision of the 1985 act has been implemented satisfactorily. For example, let's talk about the wetland conservation provision, swampbuster. Earlier this month I asked Secretary Yeutter in an appropriations hearing if the lack of any administration proposals on swampbuster was an indication that he was satisfied with its implementation. He answered that he believed that no one was happy with the way swampbuster has been implemented. I must agree with his assessment—swampbuster has not been implemented in a way that has satisfied anyone and it has not served the cause of wetlands conservation.

Progress in implementing swampbuster has been very slow. Today, 4½ years after the act was passed, wetlands determinations have been made on only about one-third of producers' farms. Experience has shown, notably in some swampbuster hotspots like North Dakota, that farmers' comfort level with swampbuster has been tremendously improved when wetlands determinations are completed. The farmer then knows with certainty what his choices are. But progress has been very slow. Let me quote a few lines from a hearing held on swampbuster:

> "I would like to review for just a moment why we in the Congress view wetlands protection as being such a high priority. Simply put, wetlands are a vital part of our environment and a vital part of our economy. Wetlands recharge ground water, help prevent floods, and improve water quality by removing nutrients (and) organic compounds and chemical fertilizers before they reach rivers and lakes.
>
> "Wetlands are also unique and irreplaceable sources of habitat for wildlife . . .
>
> "I have been greatly concerned, Mr. Chairman, by reports that swampbuster is being enforced in a lax and irregular manner in some of the states where the most important wetlands are located. I have been told for example . . . that only two farmers in the entire country have been denied farm program benefits under the Swampbuster law, and the law has been in place for over 2 years."

Mr. Chairman, that was my testimony on swampbuster on January 26, 1988, 27 months ago, and we haven't come very far since then.

According to data collected by the Soil Conservation Service, as of January 1990, on about 33 percent of the farms receiving Federal program benefits, over 82,586 acres of wetlands have been converted since 1985.

If we extrapolate this number to a full 100 percent of producers' farms, which would not necessarily be fair statistically—but nonetheless, if we extrapolate these results to all participating producers' farms, it would mean the destruction of *nearly 300,000 acres of wetlands.* I am told that many of these converted wetlands are not being used for agricultural commodity crop production, or that they are planted some years and not planted in other years depending on the participation of the producer in Federal programs. In either case those wetlands are not covered under swampbuster.

Yet, according to a National Wildlife Federation study in the summer of 1989, only 26 producers have actually had Federal program money withheld. I understand that the number may be higher now but that many of these cases remain under appeal. Let me make it clear that I do not measure swampbuster's effectiveness by the number of violations—there are those who cite a remarkably low incidence of violations as evidence that swampbuster is working admirably. I prefer to measure the success of the wetlands conservation provision in terms of whether or not wetlands are being conserved—and the numbers simply don't make sense. Agricultural wetlands conversion is continuing, and enforcement of swampbuster has apparently not yet been directed at the individuals responsible.

From time to time we hear that the definitions of wetlands continue to confuse people. One of my Wisconsin farmers put this into perspective for me. He wisely observed that if a piece of land was wet, wet enough that he wanted to drain it, it was most likely a wetland and worth a call to the Soil Conservation Service to find out for sure. Simple, straightforward, and something all of us can understand. Somehow I think all this apparent confusion on definitions is more smoke than fire.

Another area that is not attaining the goals we believed we were reaching for in 1985 is conservation compliance. In short, we intended that the standard for soil erosion be that level that ensured that long-term soil degradation be prevented and that a high level of crop productivity be sustained economically and indefinitely. I believe that deviations from this standard, the so-called soil loss tolerance concept, should be the rare exception.

A brilliant innovation of the 1985 farm bill, the farm debt restructure and conservation set-aside provisions in section 1318, never got off the ground. The idea was that farmers struggling with heavy debt loads could receive debt relief in exchange for granting conservation easements for certain environmentally sensitive lands. On a global scale, we call this "debt-for-nature," and the concept has been hailed as one of only a handful of practical techniques for lender Nations to recoup something from debtor nations unable to repay loans. I believe that we need to find a way to make this concept work in this farm bill. This approach pays double dividends by keeping farmers on the farm and protecting fragile resources.

Let me illustrate the potential of the debt-for-nature concept to resolve two problems simultaneously. According to the Department of Agriculture (January 25, 1990, testimony of Mr. Roland R. Vautour, Under Secretary for Small Community and Rural Development) the Farmers Home Administration alone is projected to bear overall losses of $22 billion as a result of farm debt restructure and other farm programs.

To put that figure in perspective of the resources we are trying to protect on American agricultural lands, that sum would purchase conservation easements on 44 million acres of cropped wetlands (at an average of $500 per acre), nearly three times the total acreage of all farmed wetlands that are causing the concern with swampbuster (17.1 million acres of cropped wetlands according to the Soil Conservation Service). That is almost 25 percent more acreage than is enrolled in the Conservation Reserve Program. We have a tremendous opportunity to manage Federal relief of farm debt to help the farmer and to protect our precious natural resources.

There are a number of growth areas building on the 1985 farm bill. They include water quality, sustainable agriculture, responsible use of agricultural chemicals, wetlands and wildlife. There is a need to balance the stick of regulation with the carrot of incentives. We must provide alternatives to farmers to encourage progressive stewardship of fragile and vulnerable natural resources. Wetlands, water quality, and soil conservation matters that concern not only adjacent landowners but the public at large.

The Conservation Reserve Program has been very popular and has largely met its primary goal of reducing soil erosion. For many of the other fragile natural resources that have been proposed to be made eligible for the Conservation Reserve Program such as wetlands, riparian areas and sinkholes, permanent protection is more appropriate and cost effective than 10 year contracts. When the easement approach is combined with allowing the farmer to engage incompatible economic uses of easement areas, I believe we have a real winner.

I believe this farm bill is the essential next step in the struggle to preserve our natural heritage—it will be the most significant conservation legislation of this Congress. Our country has been blessed with resources—it's up to us to be sensible in protecting them. As we approach Earth Day 1990—a truly global expression of our common commitment to environmental health—let us begin our concern right here at home.

Mr. Chairman, I plan to introduce legislation in a few days that will embody the ideas I have discussed today. I look forward to working with the committee as the 1990 farm bill develops. We have today an unparalleled opportunity to build a safe and healthy future for American agriculture—and set a responsible example for the whole world.

Thank you again, Mr. Chairman.

Senator FOWLER. We will have our first witness. I am going to invite Mr. Lester Brown, president of the Worldwatch Institute, to go first. I understand he has a scheduling conflict. Also, I think it would be helpful to the committee to hear from Mr. Brown first and then hear from the administration to comment on his contributions. Mr. Brown is president of the Worldwatch Institute, publisher of State of the World, which at its very least provides great contributions to the public policy debate on conservation, agriculture, ecological systems. We welcome you, Mr. Brown.

STATEMENT OF LESTER R. BROWN, PRESIDENT, WORLDWATCH INSTITUTE, WASHINGTON, DC

Mr. BROWN. Thank you, Senator Fowler.

I would like to submit a longer statement for the record, if I might, which is, in essence, the food chapter from State of the World 1990. It is our most current analysis of the world food situation.

Senator FOWLER. It will be included.

THE 1985 FARM BILL, IN MY OPINION, IS A LANDMARK PIECE OF LEGISLATION

Mr. BROWN. The 1985 farm bill, in my opinion, is a landmark piece of legislation. In effect, one that I think is going to become a model for much of the rest of the world. From what we can see between the soil erosion reduction from the Conservation Reserve Program and the estimates for the compliance program that is now taking effect, by 1995 some 1.1 billion tons of soil will be saved annually. That gets almost 70 percent of the 1.6 billion tons of excessive soil erosion that we had in this country before the 1985 farm bill took effect.

THREE ACHIEVEMENTS

Just to put this in perspective as an environmental achievement, I rank it as one of the top three achievements in the world over the last several years.

The first is Montreal Protocol on phasing out CFC's to protect the ozone layer; the second is China's success in cutting its population growth rate in half; and the third is the success of the legislation that has come from this committee in reducing U.S. soil erosion. I think it is a major achievement, and one that I do not think even most people in this country yet appreciate for its full contribution.

Just to give you a sense of what it means worldwide, we estimate that the world's farmers are losing about 24 billion tons of topsoil a year from their cropland in excess of new soil formation—24 billion tons is almost the amount of topsoil in Australia's wheatland. It is not an inconsequential loss. When you consider the problems that farmers are going to have trying to feed more than 90 million more people each year during this decade with 24 billion fewer tons of topsoil than they had the year before, you can begin to understand the significance of the U.S. achievement that is underway. Anything that protects U.S. soil protects the production capacity of U.S. agriculture, which accounts for one-sixth of the world grain harvest. Of the 300 million tons of grain that we produce each year, we export about 100 million tons to more than 100 countries. The security of our agriculture and of our soil is terribly important to the world as well as, obviously, to ourselves.

LOOK AT THE ACHIEVEMENTS OF THE 1985 FARM BILL AND THE FRAMING OF THE 1990 FARM BILL AGAINST THE CHANGING WORLD FOOD PROSPECT, AS WE SEE IT COMING INTO THE 1990'S

I would like to also look at the achievements of the 1985 farm bill and the framing of the 1990 farm bill against the changing world food prospect, as we see it coming into the 1990's. There has been a dramatic loss of momentum in the growth of world food output over the last 5 years. From 1950 until 1984, the world's farmers increased grain output by 2.6 times. That is more than doubling but less than tripling, a major achievement, never before seen within a single generation. But since 1984, there has been very little growth in world grain output. Indeed, the 1989 harvest, which was a near normal weather year for the world, was only 1 percent greater than the 1984 harvest, which means that in per capita terms, we were down about 6 percent. This also helps to explain why world grain stocks that were so excessive in the mid-1980's have dropped to one of the lowest levels since the end of World War II.

THREE FACTORS CONVERGING IN THE LATE 1980'S TO SHAPE THE FOOD PROSPECT

There are, I think, three factors converging in the late 1980's to shape the food prospect.

One is the growing scarcity of new cropland and of fresh water. Fresh water is becoming tight in many parts of the world. Falling water tables are now commonplace in a lot of countries from the North China Plain to the southern Great Plains of the United States. There has been no increase in the world cropland area over the last decade, and we do not anticipate any during the current decade. So all the gains in output now have to come from raising land productivity.

The second point is that there are not now any dramatic new technologies on the horizon such as the four that contributed to the dramatic growth in output between 1950 and 1984—hybrid corn, chemical fertilizer, irrigation and high yielding dwarf wheats and rices in the developing countries. We can see a lot of little things coming but no big ones that will lead to quantum jumps in food output as these four have over the past generation or so. So that is the second thing that appears to be slowing the growth in world food output.

The third thing is the environmental degradation of the planet. In the State of the World reports that we do each year and that you referred to earlier, we, in effect, give the Earth an annual physical examination, checking its vital signs. And what we find is that each year the forests are getting smaller, the deserts are getting larger, the topsoil layer is getting thinner in much of the world, the ozone layer is being depleted, the number of plant and animal species is diminishing, and genetic diversity generally is diminishing, the level of greenhouse gases in the atmosphere is rising, air pollution is increasing, and acid rain is increasing. Every one of these trends of environmental degradation affects food production and affects it negatively.

ANALYSES OF THE WORLD FOOD PROSPECT FOR THE 1990'S

At the moment we do not have anything resembling a monitoring system in place to assess the effect of environmental degradation in its many forms on world food output. In the chapter that I am submitting for the record, we do a couple of analyses of the world food prospect for the 1990's. One we call a ledger analysis where we look at the pluses, the factors that are contributing to the growth in world food output: increased fertilizer use, expanding irrigation, advancing technology, et cetera, et cetera. It looks to us as though we are getting something like 2 percent per year in growth in world food output as a result of these factors. That is the plus side of the ledger.

On the minus side of the ledger are the effects of soil erosion, air pollution, and of deforestation, which leads to increased flooding of the sort that we saw in Bangladesh a year ago September when two-thirds of the country was underwater for several days. A joint USDA-EPA study estimates that in this country our annual harvest is now down by at least 5 percent because of air pollution. That is mostly ground level ozone. It could be down as much as 10 percent, USDA and EPA say. If we are suffering that kind of a loss in this country, you have to wonder what is happening in Western Europe where the automobile population is far more concentrated or in Eastern Europe where they are burning so much low quality, high sulfur coal, or the Soviet Union or China, which are in a similar situation.

OZONE DEPLETION

Someone should be monitoring the effect of stratospheric ozone depletion on world crop output. We know it is negative, but to the best of my knowledge, no one is even attempting to quantify it. We know from research out at College Park that for each 1 percent increase in ultraviolet radiation, soybean yields drop 1 percent. So we have to assume that ozone depletion is affecting world harvest. But again, no one is monitoring it.

PROBABLY THE BIGGEST ENVIRONMENTAL CHANGE OF ALL IS THE WARMING OF THE PLANET

Probably the biggest environmental change of all is the warming of the planet. No one knows for sure exactly how world agriculture will be affected by a continuous rise in the average temperature of the planet. But we probably got a glimpse of what summers in the future will be like in 1988. If you recall, in the summer of 1988 severe heat and drought reduced our grain production below consumption for the first time in our history. We did not actually produce enough grain to satisfy our own needs that year. We produced 196 million tons, consumed 206 million tons. Basically, we satisfied our export commitments by exporting our reserves. We could do that in 1988. We cannot do it in 1990 if we run into that situation again because we do not have the reserves.

In looking at the effect of environmental degradation in its many forms on world food production, not including climate change, it looks as though it is reducing output by about 1 percent per year. So we have on the plus side of the ledger roughly a 2 percent increase from new investments and advancing technologies, and on the other side of the ledger, a loss of 1 percent, which gives us a net gain of 1 percent per year.

IN OUR OPINION, FOOD SECURITY IS GOING TO BE A MAJOR PUBLIC POLICY ISSUE DURING THE 1990'S

With world population still growing at close to 2 percent, that is not a promising situation. In our opinion, food security is going to be a major public policy issue during the 1990's, and in many countries may displace military security as a principal preoccupation of governments. We think what is happening in the world food/population balance is probably going to bring the environmental degradation of the planet into focus in a way that nothing else has or is likely to, so far as we can see. I would simply note that during the 1980's, there were two regions in which per capita food production and consumption fell, namely, Africa and Latin America. Both regions ended the decade with more hungry people and more malnutrition than they had at the beginning.

Unfortunately, there is not anything in sight to reverse that trend, and it looks as though people are going to get even hungrier as the 1990's progress. In Africa, it is a simple matter of the fastest population growth of any continent in history, widespread environmental degradation, soil erosion, deforestation, desertification, and rising external debt. The risk is that these trends will continue in both of these regions and spread to some other parts of the world during the 1990's.

Senator **Fowler**. Let me interrupt you there, Mr. Brown, just in the interest of your time. Please use this on that train of thought to address the question. As you know, much of the criticism of our attempts, both our committee's and the agricultural community's attempts, to come up with more environmentally sound agricultural practices runs into the criticism that we are cutting down our ability to quote "feed the world" and to provide the help that you have recognized in your surveys in our own hemisphere in Latin America, not to mention Africa. The criticism includes the fact that we cannot afford in this country to take land out of production through conservation reserve programs or other set-aside programs and still expect to be able to provide the necessary food that is asked for. How do we address that balance of doing what is environmentally sound and sane in order to protect our soil and our water and our ability to continue to sustain the kind of crops that we need and yet also undertake that responsibility that we have done so well, and that is to feed so many people by American agriculture?

Mr. **Brown**. I think the key issue is being able to play the role that we have played historically over the long-run. If we were to continue losing topsoil at the rate that we were in the 1970's and through the mid-1980's, then we would lose that capacity. It is as simple as that. The idea of taking highly erodible land out of crops and putting it in grass or trees, both of which are productive and sustainable uses over the long-term, seems to me to be eminently sensible. The alternative in many cases is simply to end up with wasteland, which is one of the reasons why countries in Africa are now so dependent on us for food.

For example, there are parts of northern Ethiopia where there is simply not enough topsoil left on the land to sustain even subsistence level agriculture, much less agriculture capable of producing a surplus. So it seems to me the key question against which the program should be evaluated is do these programs contribute to the long-term sustainable productivity of the land? Now, quite a bit of that land that is going back into grass and into trees under the conservation reserve was land that should never have been plowed in the first place. It seems to me that the real question is what the long-term productive capacity is, and there it seems to me the program is pretty much on target. I do not think I would change it very much.

Senator FOWLER. Do you have any brief concluding thoughts?

CLIMATE CHANGE

Mr. BROWN. Two or three points. One, it seems to me that this committee, if not in the bill at this point, needs to take climate change far more seriously than anyone in Washington, in official Washington, is at the moment. We, as you know, are the principal contributor to the rise in atmospheric carbon dioxide levels. We also are likely to be the principal victim. I mentioned earlier that the summer of 1988 is the sort of summer that the computer models of the global climate systems show are likely to occur with increasing frequency as the level of greenhouse gases continue to build.

You are rightly concerned about the long-term productivity of U.S. agriculture. If I had to guess right now the environmental factor that is going to have a dominant role in influencing that productivity in the 1990's and moving into the early part of the next century, I would say it is the greenhouse effect. Anything that this committee can do to represent farmers and help protect the climate, I think, is useful. For example, I think this committee should be pushing for far more fuel-efficient automobiles in this country to protect farmers' interests. What I am suggesting is that the issues that affect agriculture now go far beyond the ones that traditionally we have thought of. And some of the ones that are going to be most influential are not the ones that traditionally would have fallen within the purview of this committee.

TREE PLANTING IS IMPORTANT

The second point is that in looking not only at soil stabilization but also in pulling carbon out of the atmosphere, tree planting is important. We have a couple million acres of trees in the Conservation Reserve Program. I think anything that can be done to encourage more tree planting during the early 1990's and beyond would be a constructive thing to do.

Senator FOWLER. We are going to plant 1 billion.

Senator BOND. Each year.

Mr. BROWN. I have heard the numbers, but I have not seen the details of the plan yet. I think if we can, I think that is great, and I think that is clearly the direction we want to move in.

The CHAIRMAN. Incidentally, that bill will be introduced tomorrow, Mr. Brown.

Mr. BROWN. Super.

Senator FOWLER. That is the administration's proposal.

Mr. BROWN. Right.

The **Chairman**. This committee passed and the Senate passed, basically the same thing last year.

Senator **Fowler**. Right. We are pleased to welcome the chairman of the full committee, Mr. Leahy, here. That is the voice of doom you hear.

The **Chairman**. We know each other.

THE FOOD ISSUE

Mr. **Brown**. I think the final point I would make, Mr. Chairman, is that the food issue is going to be a dominant issue for the world in the 1990's and beyond, and on a scale that I do not think most people have yet realized, and against that backdrop, the work of this committee and the legislation you are now considering is terribly important. There is no other country in the world, no major producer, that is doing anything meaningful to reduce soil erosion. Against that backdrop we are a leader. We have provided a model for the rest of the world to look at.

Senator **Fowler**. How much of the responsibility do we bear when we teach modern agricultural techniques to developing nations to include in that the teaching of the environmentally sensitive ways to farm to prevent those modern techniques leading to the same erosion, ground water contamination and chemical runoff that has given our farmers trouble?

Mr. **Brown**. It seems to me that we have a great deal of responsibility. We have more knowledge than most of the world about these things. We have more experience. And the exciting thing that I see in the work of this committee is that it has put the United States in a leadership position on this major environmental issue, and there are not many issues in which the United States is now in the leadership position. I think you should take some justifiable pride in the achievements that we have made in U.S. agriculture.

Senator **Fowler**. Thank you, Mr. Brown.

Senator Bond.

Senator **Bond**. I will pass on this round, thank you.

Senator **Fowler**. Senator Conrad, do you have any questions?

STATEMENT OF HON. KENT CONRAD, A U.S. SENATOR FROM NORTH DAKOTA [8]

Senator **Conrad**. I do. Thank you, Mr. Chairman.

I detect a certain tension or internal contradiction in part of what you are saying, Mr. Brown, and I first want to preface this all by saying I have been a great admirer of yours over the years and read much of your work. The tension that I see is on the one hand the question of world food supply and on the other hand the Conservation Reserve Program that we have and the other set-aside programs. As you know, in the 1980's, we had up to 80 million acres of land taken out of production. With respect to the Conservation Reserve Program, I can say to you that in my State not just highly erodible land was taken out because we have a program that is paying double what cash rent pays. And so you have a bidding out process occurring that is taking not just highly erodible lands, which I think we would all agree is important to do, but taking out some of the most productive farmland in my State, as well, land that should be broken, has historically been broken, as well as that land that should never have been broken.

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[8] See pp. 495 to 515 for the prepared statement of Senator Conrad and other material submitted for the record.

And it is because we have created a structure in which we are actually paying double cash rent. In other words, cash rent in the county might be $20. We are paying $40 to put land into the conservation reserve so we are bidding out good land as well as highly erodible land. I would be interested in your reaction. Does that make sense or would we be better off being close to cash rent, getting out of the highly erodible land, and using the saved resources for other purposes, perhaps conservation purposes?

Mr. BROWN. The answer, I think, is almost implicit in your question. There is not—I was under the impression, and I am not as close to the details of the program as many others are—but I was under the impression that land had to be highly erodible in order to be taken out and had to be classified as such. If land is being taken out that is not erodible just because it is more profitable to take it out than to farm it, then it seems to me that should be remedied. The goal, it seems to me, as you formulate the program, should be that land that is not farmed, that is set aside, should be the most erodible land. That makes obvious sense, and clearly we are moving in that direction. Whether we have made it all the way is a matter of conjecture.

Senator FOWLER. Senator Gorton.

Senator CONRAD. Mr. Chairman, if I just might, one other question?

Senator FOWLER. Please.

Senator CONRAD. We have led the way in a conservation reserve, and I am wondering if you would agree with the observation that it would make sense for the United States to push negotiations with other countries that they establish substantial conservation reserve programs, which would have a twofold result. One, getting out highly erodible land elsewhere, as well as in this country; number two, it would be a good way of idling farmland for the purposes of supporting a more reasonable price in the marketplace for producers. I would be interested in your thoughts on what role the United States should play in trying to convince others to follow our lead?

Mr. BROWN. There are a number of ways in which we could intervene, I suppose, obviously with our aid programs to the extent they are substantial enough to provide leverage. Another way would be through debt relief, relating that to the adoption of responsible environmental programs including soil erosion. This is an area in which we can now speak from some strength having done this ourselves and having a model in place. As we look around the world, the other three major food producers, namely China, the Soviet Union and India, are each losing more topsoil than we were when the 1985 program took place, and none of the three countries has anything that could be called a meaningful erosion reduction program. So they are still losing soil, and it is creating serious problems for them.

So not only could we use our example with developing countries, but as our achievements become more visible for the rest of the world, then my hope is that they will begin to look at us as a model to shape their own programs.

Senator **FOWLER**. The Senator from Washington.

Senator **GORTON**. Mr. Chairman, I do not have any questions for Mr. Brown. I do want to say, however, how magnificently refreshing it is to have someone come before the committee, understand his subject so well, speak just on the basis of his notes rather than reading a speech we have already had an opportunity to do so. I can say that that causes about four times as much listenership and absorption on my part than to have to listen to someone read a speech. I simply want to compliment this witness for being one of the best that I have come across for some time in that respect.

Mr. **BROWN**. Perhaps I should leave on that note.

Senator **FOWLER**. I would if I were you. Chuck, do you have any questions of the witness?

Senator **GRASSLEY**. I do not have any questions. Thank you, Mr. Chairman.

Senator **FOWLER**. Mr Brown, let me ask you a—we ought to let you go in light of that great compliment from Mr. Gorton, but as you know, some of your colleagues, and actually in some of your writings, it could be concluded, and oftentimes, though not exactly this way by you, but by some of your colleagues like Mr. Edward Goldsmith, for instance, that modern agriculture is totally uneconomic. That it simply cannot be sustained over the long-run when you look at the cost of the capital of the technology and the environmental cost that modern agricultural techniques extract from the soil. How do you react to that? Since you are looking globally and at the long-term implications of our farming practices, both in the United States and around the world, how do you react to that charge by some?

Mr. **BROWN**. I think there has been a tendency in recent years to recognize that in some cases we are probably using inputs that were not needed, and I think some of that is becoming clear. Mechanically applying pesticides every 8 days during the growing season on a crop, for example, which is the way it used to be done, probably does not make sense anymore from either an economic or an environmental point of view. We are seeing farmers respond on their own to some of these things.

Fertilizer use in this country has not increased now for, I suppose, it is close to a decade or so. We are seeing reductions in some countries. In the Soviet Union, interestingly, as the economic reforms take place and they move toward world market prices for both inputs and commodities, their fertilizer use is dropping, and that is probably because they were overusing fertilizer, that is, in a way that was not economic. They use a ton of fertilizer to produce about 8 tons of grain, and we use 1 ton of fertilizer to produce about 16 tons of grain. Now if our farmers are being rational, using something approaching world prices, then you have to assume that there is a very substantial uneconomic use in the Soviet Union, and as the reforms take place, I think we are going to see, and indeed are already seeing, a very substantial drop in fertilizer use.

I feel, however, that the idea of abandoning all modern agricultural techniques, as someone suggested, is simply not in the cards. When there were 2½ billion people in the world, that might have been an option, but with 5.2 billion and adding 90 million a year, we have lost some of the options now. I think we are dependent on the use of chemical fertilizer at least on some scale in various parts of the world as far as we can see into the future. I see no alternative to that. I think the key is to use the inputs more intelligently, and I think we are beginning to see that. In looking at the bill that you introduced last winter, I see some indications of activities to support movement in that direction. I think that is desirable.

Senator FOWLER. Mr. Brown, thank you very, very much for your participation.

Mr. BROWN. My pleasure.

[The prepared material of Mr. Brown follows:]

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STATEMENT

OF

LESTER R. BROWN

PRESIDENT, WORLDWATCH INSTITUTE

BEFORE THE

SUBCOMMITTEE ON CONSERVATION AND FORESTRY

COMMITTEE ON AGRICULTURE

U.S. SENATE

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4

Feeding the World in the Nineties *

Lester R. Brown and John E. Young

As we enter the nineties, the world has little to celebrate on the food front. Between 1950 and 1984, the world's farmers raised world grain output 2.6-fold, an increase that dwarfed the efforts of all previous generations combined. Since then, unfortunately, little progress has been made. The share of hungry and malnourished people in Africa, Latin America, and parts of Asia has increased.[1]

Drought-damaged harvests in key producing countries in 1987 and 1988 brought world grain stocks to one of their lowest levels in decades—little more than is needed to fill the "pipeline" from field to table. They also brought world wheat prices in 1989 up by 48 percent from their all-time low of two years before. Rice prices, which in 1986 reached their lowest point, were up 38 percent.[2]

With higher prices and better weather in 1989, it was widely assumed that production would surge upward and stocks would be rebuilt. But this did not happen. The 1989 world grain harvest shortfall—18 million tons below the projected consumption of 1,685 million—reduced depleted stocks even further. If stocks cannot be replenished in years of near-normal weather, when can they be?[3]

Rebuilding stocks depends on pushing production above consumption, a task that is becoming more difficult. Growth in world food output is being slowed by environmental degradation, a worldwide scarcity of cropland and irrigation water, and a diminishing response to the use of additional chemical fertilizer. Meanwhile, the annual addition to our numbers is moving above 90 million people.[4]

DEGRADATION AFFECTING HARVESTS

Nearly all forms of global environmental degradation are adversely affecting food production: Soil erosion is slowly undermining the productivity of an estimated one third of the world's cropland. Deforestation is leading to increased rainfall runoff and crop-destroying floods. Damage to crops from air pollution and acid rain can be seen in industrial and developing countries alike. Data from experimental plots indicate that yields of some crops, such as soybeans, are reduced by the increased ultraviolet radiation associated with stratospheric ozone depletion. Waterlogging and salinity are lowering the productivity of a fourth of the world's irrigated cropland. (See Chapter 3.) Global climate change in the form of hotter summers may also be taking a toll.[5]

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* This statement is excerpted from State of the World 1990 (New York: W.W. Norton, 1990), Chapters 1 and 4.

In this section, we attempt to estimate how much productive capacity the world has lost through these many forms of environmental degradation. We cannot present a detailed set of precise data on such crop losses, because such data do not exist. But we hope this presentation will help focus attention on how damaging these environmental influences have become, and that it will encourage the principal institutions involved in international agricultural development, such as the World Bank and the U.N. Food and Agriculture Organization (FAO), to research the effect of environmental degradation on grain output.

Reports of land degradation have come from every corner of the planet. In July 1989, Australian Prime Minister Robert Hawke said that "none of Australia's environmental problems is more serious than the soil degradation . . . over nearly two-thirds of our continent's arable land." *Pravda* reports that the Soviet Union is suffering from a catastrophic decline in soil fertility. Prime Minister Rajiv Gandhi has outlined the ecological and economic crisis India faces as the result of continuing deforestation and the associated degradation of land.[6]

Each year, the world's farmers lose an estimated 24 billion tons of topsoil from their cropland in excess of new soil formation. During the eighties, this translated into a loss of 240 billion tons, an amount more than half that on U.S. cropland.[7]

Agronomist Harold Dregne has classified agricultural land in each major geographic region into one of three categories according to the degree of degradation. Slight degradation includes all land where the yield potential has been reduced by less than 10 percent; moderate erosion, land where it has been reduced between 10 and 50 percent; and severe erosion, a reduced potential of more than 50 percent. All regions have some severely degraded land, but Africa, Asia, and South America have much more in this category than North America and Europe do. (See Table 4-1.)

According to FAO, soil erosion could reduce agricultural production in Africa by one fourth between 1975 and 2000 if conservation measures are not adopted. The shifting cultivation traditionally practiced in Africa to maintain soil fertility has begun to deteriorate under high population densities as farmers return to the same plot every 5–10 years instead of waiting 20–25 years, as they used to.[8]

Table 4-1. Estimated Land Degradation in the Late Seventies

Continent	Slight	Moderate	Severe	Total
	(percent of land surface)			
Africa	60	23	17	100
Asia	56	28	16	100
Australia	38	55	7	100
Europe	69	25	6	100
N. America	70	23	7	100
S. America	73	17	10	100

SOURCE: U.S. Department of Agriculture, Economic Research Service, *World Agriculture Situation and Outlook Report*, Washington, D.C., June 1989, based on data compiled by Harold E. Dregne.

As the fallowing cycle shortens and the land's vegetative cover diminishes, soil erosion and land degradation accelerate. Gbdebo Jonathan Osemeobo of Nigeria's Federal Department of Forestry notes that "shifting cultivation has a 'catalytic' effect on the encroachment of desert in the northern parts of Nigeria—namely in Sokoto, Kano, Kaduna, Bauchi, and Borno states." He believes that this land is now only marginal for either forestry or farming.[9]

The effect of topsoil losses on U.S. land productivity has been well established by 14 studies on corn and 12 on wheat. The former, done mostly in the Corn Belt states, showed that a loss of one inch of topsoil reduced corn yields by roughly 6 percent. Results for wheat, taking an average for the 12 studies, also showed a drop of 6 percent for each inch of topsoil lost.[10]

Applying this to the world as a whole, the loss of 24 billion tons of topsoil annually (equal to one inch on 61 million hectares) would reduce the grain harvest of 146 million tons from this area by 6 percent (assuming the world average yield of 2.4 tons per hectare), or 9 million tons per year. Alternatively, for purposes of calculation, we could assume that all the topsoil (typically seven inches deep) was lost from 9 million hectares, leading to the land's abandonment and the loss of more than 21 million tons of grain production per year. Choosing to be conservative, we have included the lower estimate in our tabulation of environmental losses of productivity.[11]

Land is also being degraded by changing soil chemistry, as rising concentrations of salt in irrigated soils reduce harvests on some of the world's most intensively farmed land. (These issues are discussed in more detail in Chapter 3.) In the haste to complete irrigation projects from 1950 to 1980, the drainage facilities essential to the long-term success of these systems were frequently omitted. When river water diverted onto farmland percolates downward and there is no drainage, it gradually raises underground water tables. When these get close to the surface, water evaporates into the atmosphere, concentrating salts in the upper few inches of soil.

In industrial and developing countries alike, waterlogging and salinity are lowering yields on an estimated 24 percent of the world's irrigated cropland. (See Chapter 3.) As with soil erosion, these processes gradually lower land productivity until eventually farming the land is no longer profitable and it is abandoned. Assuming an estimated 1-percent annual decline in output on 24 percent of the 180 million hectares of irrigated grain, mostly rice and wheat, with an average yield of 2.5 tons per hectare, an additional 1.1 million tons of grain output are lost each year. Alternatively, using the estimate by Soviet agronomist Victor Kovda of worldwide abandonment of 1–1.5 million hectares of irrigated land each year would yield an annual loss in grain output of 2.4–3.6 million tons. For our tabulation, we use the lower figure of 1.1 million tons.[12]

Deforestation affects food production in several ways. It directly alters the local hydrological cycles by increasing runoff and, perhaps less obviously, by affecting the recycling of rainfall inland. The former is now strikingly evident in the Indian subcontinent, where deforestation of the Himalayan watersheds is raising rainfall runoff, leading to increasingly severe flooding. The area subject to annual flooding in India has more than tripled since 1960. (See Table 4–2.)

This process was also tragically demonstrated in early September 1988, when two thirds of Bangladesh was under water for several days. This flood—the worst on record—damaged the country's fall rice crop, increasing its need to import grain.[13]

As long as deforestation continues,

Table 4-2. India: Area Subject to Flooding

Year	Area
	(million hectares)
1960	19
1970	23
1980	49
1984	59

SOURCE: Centre for Science and Environment, *The Wrath of Nature: The Impact of Environmental Destruction on Floods and Droughts* (New Delhi: 1987).

firewood will become ever more scarce, forcing villagers to burn more cow dung and crop residues. This deprives the soil not only of nutrients, but also of the organic matter that helps maintain a healthy soil structure. One region for which data are available, the state of Madhya Pradesh in central India, is already far down this road: of the three principal cooking fuels used by its 62 million people, cow dung accounts for 9.6 million tons, firewood 9.5 million tons, and crop residues 6.9 million tons. Similar pressures are draining the land of productivity in other Indian states, in Bangladesh and Pakistan, in scores of African countries, and in China.[14]

Damage to crops from air pollution can now be measured in automobile-centered societies and coal-burning economies.

Researchers have only recently identified two other threats to future food security: cars and coal-fired power plants. Damage to crops from air pollution can now be measured in the automobile-centered societies of Western Europe and the United States and in the coal-burning economies of Eastern Europe and China. Much of what we know about this subject comes from a seven-year study jointly sponsored by the U.S. Environmental Protection Agency and the U.S. Department of Agriculture (USDA). The report concluded that ozone, sulfur dioxide, and nitrous oxides are the most damaging air pollutants in the United States.[15]

Of these pollutants, ozone does by far the most damage. Crops are incredibly sensitive to minute amounts of ground-level ozone, amounts measured in parts per million (ppm). As ground-level ozone rises above the naturally occurring 0.025 ppm, damage begins to show at 0.05 ppm if this exposure level lasts for more than 16 days of a growing season, at 0.10 ppm if it lasts for 10 days or more, and at 0.30 if it lasts 6 days or more. The potential for damage is evident in the readings from some 70 widely scattered sites across the United States where average ozone concentrations for the season ranged from 0.038 ppm to 0.065. Surprisingly, damage from ozone occurred in sparsely populated rural areas as well as in densely populated urban ones.[16]

Experimentally increasing ozone concentrations from 0.04 ppm to 0.09 ppm as a seasonal average reduced yields of crops rather dramatically. For corn, the loss went from 1 percent at 0.04 ppm to 13 percent at 0.09 ppm. For soybeans, from 7 percent to 31 percent. And for winter wheat, from 4 percent to 27 percent. Ground-level ozone at levels that prevailed during the eighties led to an estimated U.S. crop loss of at least 5 percent, and possibly as much as 10 percent.[17]

Using the lower figure of 5 percent for ozone damage and ignoring the harm caused by other air pollutants, the 1987 grain harvest for the most severely affected regions—North America, Europe (excluding the Soviet Union), and China—of 913 million tons was reduced by 48 million metric tons. Since most of the growth in fossil fuel burning, the source of the pollutants, has occurred over the last 40 years, we assume growth in the annual loss is roughly 1 million tons.[18]

While ground-level ozone reduces harvests, depletion of the ozone layer in the upper stratosphere and the resulting rise in ultraviolet radiation reaching the earth's surface also may be taking a toll, particularly of the more sensitive crops, such as soybeans. A U.S. government panel measured the worldwide loss of stratospheric ozone at roughly 2 percent from 1969 to 1986. For each 1-percent loss of stratospheric ozone, the ultraviolet radiation reaching the earth increases by 2 percent. Data from experimental plots indicate that each 1-percent increase in ultraviolet radiation lowers soybean yields by a like amount. This suggests that depletion of the stratospheric ozone layer may now be reducing measurably the output of the world's leading protein crop; unfortunately, no one is monitoring this loss to determine its precise dimensions.[19]

Of all the global changes we have set in motion, climate change is potentially the most disruptive. Already suffering from slower growth in food output, the world is now confronted with the prospect of hotter summers. The drought- and heat-damaged U.S. grain harvest in 1988, which fell below consumption for the first time in history, dramatically illustrated how hotter summers may affect agriculture over the longer term.[20]

Climate change will not affect all countries in the same way. The projected rises of 2.5–5.5 degrees Celsius (4.5–9.9 degrees Fahrenheit) by late in the next century are global averages. But temperatures are expected to increase much more in the middle and higher latitudes and more over land than over the oceans. They are projected to change little near the equator, while in the higher latitudes rises could easily be double that projected for the earth as a whole. This uneven distribution will affect world agriculture disproportionately, since most food is produced on the land masses in the middle and higher latitudes of the northern hemisphere.[21]

Agriculture is affected by climate change in innumerable ways. Hotter summers lead to more evaporation during the growing season, increasing the likelihood of drought. The effects of higher temperatures on agriculture have so far focused mostly on soil moisture and drought-related conditions, but extreme heat can interfere with the pollination of staple food crops. Corn pollination can easily be impaired by high temperatures during the 10-day period when fertilization occurs. Alan Teramura of the University of Maryland reports that even a rise of 2 degrees Celsius in summertime temperatures in some key Asian rice-growing regions can sharply reduce harvests.[22]

In 1988, the hottest year in the last century, each of the world's three leading food producers suffered a reduction in harvest as a result of heat and drought: the U.S. grain harvest was down from its 1987 level by 27 percent (74 million tons), the Soviet harvest by 8 percent (16 million tons), and the Chinese harvest by 2 percent (7 million tons). No one can say for sure whether any of this 97-million-ton drop was due to the buildup of greenhouse gases, but the summer of 1988 was the kind of season that global meteorological models project will occur with increasing frequency as heat-trapping gases continue to accumulate in the atmosphere. Crop losses from the hotter summers that are in prospect seem likely to far offset the gains.

In summary, we have a lot more to learn about the effects on world agriculture of these various forms of environmental degradation. Soil erosion, the waterlogging and salinization of irrigated land, flooding, air pollution, acid rain, stratospheric ozone depletion, and hotter summers may all be taking a growing toll on food production. We estimate that the world could be losing 14 million additional tons of grain output each year because of this damage to land and crops. (See Table 4–3.) And this does not include any allowance for the effects of hotter summers, such as those experienced during the eighties and projected for the nineties. Stated otherwise, if there were no additional investments in agriculture or technological progress, the world grain harvest would fall 14 million tons annually—nearly 1 percent a year—as a result of environmental degradation.

The key question is, How does this loss compare with the gains from greater investment in irrigation, fertilizer, and other inputs? If we assume that the newly irrigated land of 2.3 million hectares per year during the eighties boosts output an average 1.5 tons per hectare above its previous level, then more than 3 million tons of grain is added to the world harvest each year. The 3 million more tons of fertilizer used each year (assuming that each ton of fertilizer raises output by 7 tons) adds another 21 million tons. If we generously allow another 5 million tons of added output per year from other sources, the total gain is 29 million tons.[25]

The world could be losing 14 million additional tons of grain output each year because of damage to land and crops.

Subtracting the 14 million tons we estimate are lost each year from environmental degradation therefore leaves a net gain in output of 15 million, well

Table 4-3. Crude Estimate of Additional Loss of World Grain Output Each Year as a Result of Environmental Degradation

Form of Degradation	Grain Output Loss
	(million tons)
Land Degradation	
Soil erosion	9
Waterlogging and salting of irrigated land	1
Loss of soil organic matter from burning cow dung and crop residue	2[1]
Shortening of shifting cultivation cycle	
Compaction of soil from heavy equipment	
Crop Damage	
Air pollution	1
Flooding	1[1]
Acid rain	
Increased ultraviolet radiation	
Total	14

[1] Because the lack of data makes it difficult to quantify the crop losses from these three sources, their effect is estimated collectively.

SOURCE: Worldwatch Institute estimates.

below the 28 million tons required to merely keep pace with population growth. In effect, this shows a net gain in grain output of just under 1 percent per year while population growth is close to 2 percent. This does not allow for any rises in demand from rising affluence. This offsetting effect of pressures on the environment may partly explain why the growth in world grain output has slowed so dramatically recently.

1

The Illusion of Progress

Lester R. Brown

* * *

The Bottom Line

We know that we cannot continue to damage our life-support systems without eventually paying a price, but how will we be affected? What will the price be? Is it likely to be a buildup of carcinogens in the environment so severe it increases the incidence of cancer, dramatically raising death rates? Or will the rising concentration of greenhouse gases make some regions of the planet so hot that they become uninhabitable, forcing massive human migrations? Or will it be something we cannot even anticipate yet?

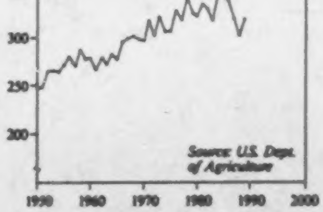
We also know we cannot keep adding ever more people to the planet each 12 months. Adding 88 million people a year—the equivalent of the population of the United Kingdom combined with those of Belgium, Denmark, Ireland, Norway, and Sweden—will eventually get us into trouble. What form will that trouble take? And is it imminent or in the distant future?[30]

Amidst the uncertainty, food scarcity in developing countries is emerging as the most profound and immediate consequence of global environmental degradation, one already affecting the welfare of hundreds of millions. All the principal changes in the earth's physical condition—eroding soils, shrinking forests, deteriorating rangelands, expanding deserts, acid rain, stratospheric ozone depletion, the buildup of greenhouse gases, air pollution, and the loss of biological diversity—are affecting food production negatively. Deteriorating diets in both Africa and Latin America during the eighties, a worldwide fall in per capita grain production since 1984, and the rise in world wheat and rice prices over the last two years may be early signs of the trouble that lies ahead.[31]

After a generation of record growth in world food output, it sometimes seemed that the rapid ascent in production of this essential commodity could continue indefinitely. The 2.6-fold increase in the world grain harvest between 1950 and 1984 (nearly 3 percent a year) raised per capita production by more than one third. But between 1984 and 1989, overall output rose by only 1 percent. (See Figure 1–1.) This five-year period is too short to show a trend because weather fluctuations could be partly responsible for the slowdown, but it is an unsettling interruption in food output growth.[32]

The downturn in grain production per capita that became firmly established in Africa during the seventies and spread to Latin America during the early eighties thus engulfed the entire world in the late eighties. In 1989, higher grain prices to farmers, the return to production of idled U.S. cropland, and near-normal weather were expected to restore production and permit a rebuilding of depleted grain stocks. But this did not happen. With carryover stocks now amounting to little more than pipeline supplies, there is little cushion for short harvests in the future. Falls in production will translate directly into falls in consumption.[33]

Why has production not increased during this five-year period, a time in



Source: U.S. Dept. of Agriculture

Figure 1-1. World Grain Production Per Capita, 1950–89

which the world's farmers invested billions of dollars to expand output, and in which fertilizer use increased by 18 million tons, a gain of 14 percent? There is no single explanation. Three historical trends are converging to make it more difficult to expand world food output. One is the growing scarcity of new cropland and fresh water that affects most of the world. The second is the lack of any new technologies, such as hybrid corn or chemical fertilizer, that can dramatically boost output. And the third is the negative effects of planetary environmental degradation on food production. Any one of these trends could slow the growth in food output. But the convergence of all three could alter the food prospect for the nineties in a way the world is not prepared for.[34]

The sad reality is that the contributions to increased output of greater fertilizer use, continuing modest expansion in irrigated area, and other technological advances are being partly offset by soil erosion, the waterlogging and salinity of irrigated cropland, air pollution, and several other forms of environmental degradation. (See Chapter 4 for a more detailed analysis of these environmental effects.)

The first concrete economic indication of broad-based environmental deterioration now seems likely to be rising grain prices. After reaching an all-time low of $224 per ton in 1986 (in 1988 dollars), rice prices rose to an estimated $309 for 1989, an increase of 38 percent. Wheat prices, which bottomed in 1987 at $117 per ton, rose 48 percent, to an estimated $173 per ton in 1989. (See Figure 1-2.) If world grain production should surge upward in the nineties, this price rise will be checked. If, on the other hand, the world's farmers still have difficulty expanding production at the 28 million tons a year required merely to maintain current per capita consumption levels, prices could rise dramatically—as they did in the mid-seventies.[35]

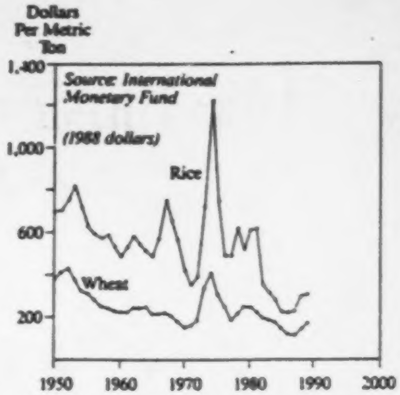


Figure 1-2. World Wheat and Rice Prices, 1950–89

The combination of falling incomes in most of Africa and Latin America and the grain price rises of the last few years has forced consumption below the level of survival for millions. An estimated 40,000 infants die each day in the Third World as a result of severe nutritional stress and infectious disease. Tragically, higher grain prices also mean that food assistance, which is determined by budgetary allocations, is actually falling just as chronic food scarcity becomes a part of the landscape in much of the Third World.[36]

If before stocks are rebuilt the United States experiences a drought-reduced harvest, grain exports will slow to a trickle.

The world enters the nineties not only with a low level of grain in reserve, but with little confidence that the "carryover" stocks can be rebuilt quickly. Sketching out the consequences of a poor harvest while stocks are this low sounds like the outline of a science fiction catastrophe novel. If before stocks are rebuilt the United States experiences a drought-reduced harvest similar to that of 1988, which dropped grain production below domestic consumption, U.S. grain exports will slow to a trickle. Nearly everything produced would be needed to satisfy domestic consumption. By early fall, the more than 100 countries that import U.S. grain would be competing for meager exportable supplies from Argentina, Australia, and France. Fierce competition could double or triple grain prices, driving them far above any level previously experienced.[37]

By early winter, the extent of starvation, food riots, and political instability in the Third World would force governments in affluent industrial societies to consider tapping the only remaining food reserve of any size—the 600 million tons of grain fed to livestock. If they decided to restrict livestock feeding and use the grain saved for food relief, governments would have to devise a mechanism for doing so. Would they impose a meat tax to discourage consumption and free up grain? Would they ration livestock products, much as was done in many countries during World War II?[38]

Forcing millions of the world's poor to the brink of starvation would be the most immediate and tragic consequence of such a food emergency, but the international monetary system would also be in jeopardy. Third World governments desperately trying to import enough high-priced grain to avoid widespread starvation would have little foreign exchange for debt payments. Whether all the major international banks could withstand such a wholesale forfeiture of income is problematic. At this point, the effects of food scarcity would spread beyond the Third World hungry, driving interest rates upward and threatening the integrity of leading international financial institutions. The linkage between the environmental degradation of the planet and the economic prospect would have become all too apparent.

The number of hungry people in the world has increased dramatically during the eighties. Reversing the spread of hunger will depend on a massive effort to cut the world rate of population growth and restore the health of the planet. We can no longer separate our health from that of our home. If the health of the planet continues to deteriorate, so will that of its inhabitants.[39]

In many ways, changes in the amount of grain that can be sustainably produced per person may be the best single indicator of success in the battle to save the planet. If an upward trend can be restored in the years immediately ahead—one that reduces hunger and malnutrition—it will be a clear sign of victory. If, on the other hand, per capita grain supplies continue to decline, leading the world into an era of food scarcity, rising food prices, and political instability, it will be a sure sign that the battle is being lost.

* * * * * * *

LAND, WATER, AND FERTILIZER

From the beginning of agriculture until mid-century, growth in the world's cultivated area more or less kept pace with that of population, but starting around 1950 it slowed to a crawl. After actually falling in the mid-eighties, growth in cropland has recovered somewhat as the United States returned to production some land previously idled under agricultural supply management programs.[24]

Each year millions of hectares of cropland are lost either because the land is so severely eroded it is not worth plowing anymore or because new homes, factories, and highways are built on it. Losses are most pronounced in the densely populated, rapidly industrializing countries of East Asia, including China, Japan, South Korea, and Taiwan, where nonfarm uses claim roughly a half-million hectares of cropland each year.[25]

Other large, densely populated countries suffering losses include India and Mexico. Both the Soviet Union and the United States are pulling back from rapidly eroding land. Abandonment of such cropland plus an increase in alternate-year fallow to maintain yields has reduced the Soviet grain area some 13 percent since 1977. Fearing similar losses, the United States adopted a five-year plan beginning in 1986 to plant 40 million acres (16 million hectares) of rapidly eroding cropland to grass or trees before it became wasteland. By mid-1989, 32 million acres were committed, but budget-cutting congressional committees—looking primarily at short-term costs—eliminated funding for further additions to the program.[26]

Worldwide, the potential for profitably expanding cultivated area is limited. A few countries, such as Brazil, will be able to add new cropland. But on balance, gains and losses in the nineties are likely to largely offset each other, as they did during the eighties. As a result, the global decline in grain area per person from 0.16 hectares in 1980 to an estimated 0.14 hectares in 1990 seems certain to continue. (See Table 4–4.)[27]

The prospect for expanding the world's gross irrigated area is only slightly more promising. After growing slowly during the first half of this century, the irrigated area increased from 94 million hectares in 1950 to 236 million in 1980, as investment in irrigation soared in both large-scale river-diversion projects and farmer-owned irrigation pumps using groundwater. This expanded the gross irrigated area per person by 43 percent. (See Table 4–5.)

By 1980, however, most of the economically attractive sites for large irrigation reservoirs had been developed, and the number of newly completed projects dwindled. The expansion in world irrigated area slowed dramatically, falling behind population growth. As it continues to slow, the gains from new capacity may be largely offset by losses from waterlogging and salinity, falling water tables, and the silting of existing reservoirs discussed earlier.

With the net gain in world irrigated land estimated at only 23 million hectares during the eighties, the irrigated

Table 4-4. World Grainland, Total and Per Capita, 1950–80, With Projections to 2000

Year	Total Grainland	Per Capita Grainland	Per Capita Change By Decade
	(million hectares)	(hectares)	(percent)
1950	593	0.23	
1960	651	0.21	− 8
1970	673	0.18	−15
1980	724	0.16	−11
1990	720	0.14	−16
2000	720	0.12	−15

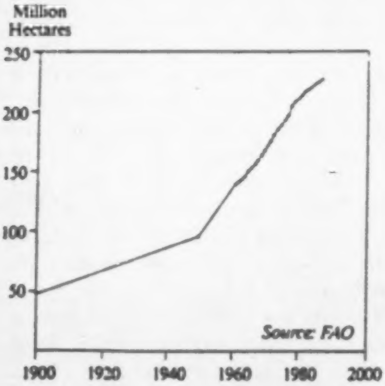
SOURCES: Grainland 1950–80 from U.S. Department of Agriculture (USDA), Economic Research Service (ERS), *World Grain Harvested Area, Production, and Yield, 1950–88* (unpublished printout) (Washington, D.C.: 1989); 1990 and 2000 figures are authors' estimates; per capita figures derived from population data (based on data from U.S. Bureau of the Census) in Francis Urban and Philip Rose, *World Population by Country and Region, 1950–86, and Projections to 2000* (Washington, D.C.: USDA, ERS, 1988); figures are rounded, with calculations based on original unrounded data.

area per person shrunk by close to 8 percent over the last decade. Although the cropland area per person has been falling steadily since mid-century, this trend of shrinking irrigated area per person is new, making this the first decade in which both have declined. This, too, may help explain the markedly slower growth of food production during the late eighties.

The growth pattern in total irrigated area (see Figure 4–1) conforms to what is known as the S-shaped growth curve, which describes well any growth process in a finite physical environment. It is also a trend that describes the historical growth of cropland area, with the trend leveling off during the eighties. In this case, the trend has made the final turn on the S and has flattened out.

This S-shaped curve pattern is particularly familiar to biologists who chart the growth of various organisms in finite environments. As a laboratory exercise, biology students learn about the concept by watching the increase of a population of fruit flies in a jar or of algae in a petri dish when they are given all the food they need. At first growth is slow, as a few organisms reproduce. Then it accelerates until some constraint such as the physiological stresses associated with high density or the accumulation of waste begins to slow it, eventually bringing it to a halt.

We know that the rise in grain yield per hectare, like any biological growth process in a finite environment, will also eventually conform to the S-shaped growth curve. What we do not know is how close grain yields in agriculturally advanced countries now are to the final turn on the S. Interestingly, world growth in the use of inputs that are rais-



Source: FAO

Figure 4-1. World Net Irrigated Area, 1900–87

Table 4-5. World Gross Irrigated Area, Total and Per Capita, 1950–80, With Projections to 2000

Year	Total Irrigated Cropland	Per Capita Irrigated Cropland	Per Capita Change By Decade
	(million hectares)	(hectares)	(percent)
1950	94	0.037	
1960	136	0.045	+22
1970	188	0.051	+13
1980	236	0.053	+ 4
1990	259	0.049	− 8
2000	279	0.045	− 8

SOURCES: Data for 1950–80 adapted or derived from W. Robert Rangeley, Washington, D.C., private communication, June 1989, and from U.N. Food and Agriculture Organization, *FAO Production Yearbook 1988* (unpublished printout) (Rome: 1989); projections for 1990 and 2000 are Worldwatch Institute estimates; per capita figures derived from population data (based on data from U.S. Bureau of the Census) in Francis Urban and Philip Rose, *World Population by Country and Region, 1950–86, and Projections to 2000* (Washington, D.C.: U.S. Department of Agriculture, Economic Research Service, 1988).

ing yields—fertilizers and high-yielding varieties, as well as irrigation—are all conforming to the S-shaped growth curve as the nineties begin.

From mid-century on, the increasing use of chemical fertilizer has been the engine powering the growth in world food output. Between 1950 and 1989, world fertilizer use climbed from a meager 14 million tons to an estimated 143 million tons. If for some reason fertilizer use were abruptly discontinued, world food output would probably plummet some 40 percent or more.[28]

The contribution of the other two yield-raising inputs—irrigation and high-yielding varieties—derives heavily from their ability to boost the effectiveness of fertilizer. Hybrid corn, which was initially developed in the United States and has since spread throughout the world, was widely adopted because it responded readily to heavy applications of nitrogen fertilizer. Third World farmers switched from traditional varieties to the high-yielding dwarf wheats and rices that defined the Green Revolution precisely because the new varieties were so responsive to fertilizer.

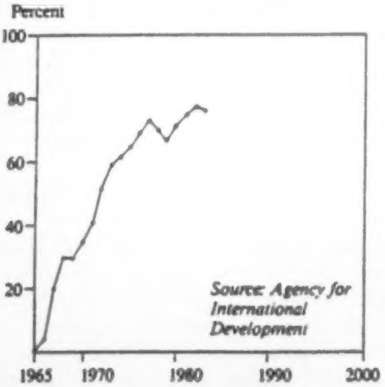
Rapid growth in fertilizer use depends therefore on the continued spread of high-yielding seeds. But the adoption of these newly introduced crop varieties also follows an S-shaped trend. Their use by farmers increases slowly at first, as a few innovative growers plant them, and then more rapidly as large numbers of farmers see their advantage. Eventually, adoption slows and levels off as the new strains are planted on all suitable land.

The adoption curve for high-yielding wheats in India, which helped to double the wheat harvest between 1965 and 1972, illustrates this well. (See Figure 4–2.) These new strains are unlikely to reach all wheat-growing areas because much of what is left is semiarid land where the new varieties do not fare well. Graphs on the use of high-yielding corn in the United States, of high-yielding rices in Indonesia, and of high-yielding wheats in Mexico all show the same S-shaped curve.[29]

Once the new fertilizer-responsive varieties are planted on all suitable land, growth in fertilizer use also slows. Such a trend is now apparent in some major food-producing countries. After quintupling between 1950 and 1981, fertilizer use in the United States has fallen somewhat, and was slightly lower in 1989 than when the decade began. Within the Soviet Union, where heavy subsidies of fertilizers have led to their overuse, the move toward world market prices as part of the recent agricultural reforms is likely to actually reduce fertilizer use in the years ahead.[30]

Many developing countries are now also experiencing diminishing returns in fertilizer use. Both China and India have grain-fertilizer response ratios very similar to that of the United States, suggesting that future growth in fertilizer use will be much slower. And given the dependence of fertilizer use on water availability, the reduced growth in irrigation documented earlier is almost certain to affect fertilizer use as well. Fertilizer use will continue to expand as varieties with an even greater yield potential are developed, but where yields are already high by international standards, the output gains are likely to be modest compared with the quantum jump that came from the initial adoption of high-yielding varieties.[31]

The ultimate natural constraint on the rise of crop yields will be imposed by the upper limit of photosynthetic efficiency, a limit set by the basic laws of physics and chemistry. As the genetic potential of high-yielding varieties approaches this level, the response of crops to the use of additional fertilizer diminishes. Advances in plant breeding, including those using biotechnology, can help yields rise toward the photosynthetic limit, but there is little hope of altering the basic mechanics of photosynthesis.



Source: Agency for International Development

Figure 4-2. Share of Wheatland Planted to High-Yielding Varieties in India, 1965–83

BIOTECHNOLOGY: A LIMITED CONTRIBUTION

Grandiose claims about biotechnology and food production have been common since the first successful attempts at genetic engineering in the early seventies. As recently as 1984, one writer predicted that "in 5 to 10 years, Saudi Arabia may look like the wheat fields of Kansas." The unfortunate reality in 1989—when Kansas lost over a third of its wheat crop to drought—was that the wheat fields of Kansas came to resemble the still-fallow Saudi Arabian desert.[32]

Biotechnology has proved more difficult to apply to agriculture than its champions expected. It will not revolutionize agriculture overnight—but it could be an important new weapon in the fight against hunger.

To realistically gauge biotechnology's potential to help close the widening gap between the growth in world food supplies and that in human numbers, two questions must be answered. First, is the new biology technically capable of sharply boosting agricultural yields—particularly those of the cereal crops that feed most of the world's people—to a degree comparable to the increases of the past four decades? And second, are the institutions now engaged in biotechnology research likely to achieve the breakthroughs needed to help feed the world's hungry?

It is difficult to overstate the revolutionary nature of the biological discoveries of the last two decades. The assortment of techniques referred to as biotechnology is opening new frontiers in areas from manufacturing to health care to pollution cleanup. Biotechnology has moved rapidly from universities into the laboratories and factories of industry. Like most revolutionary technologies, it has its strengths and weaknesses, and presents an array of potential difficulties as diverse as its promises.

Genetic engineering—the direct transfer of genes, which encode all life processes, from one organism to another—is the best-known and most fundamental of the new biological techniques. Tissue culture, an older technology that has advanced tremendously in recent years, is particularly important in plant biotechnology because it allows whole plants to be generated from single cells or small samples of tissue.[33]

In livestock production, a number of new techniques may allow biotechnology to live up to its technical promise. Hormones that speed and increase livestock weight gain per unit of feed and that increase the milk production of dairy cows can now be mass-produced by genetically altered bacteria. Similarly, veterinary vaccines and drugs can be made by microbes, and genetic techniques are allowing the quick and inexpensive diagnosis of many animal diseases. Livestock breeding may be speeded up and made more consistent by a variety of techniques involving manipulation of sperm and ova.[34]

Animal biotechnology has moved forward quickly because much more is known about the basic cell processes of animals than of plants, and because human health products are usually tested first in animals. Although the social impacts, safety, and long-term performance of some of the new animal biotechnologies are quite controversial, they are advancing rapidly, with some already commercialized.[35]

But plants—the ultimate source of all food—have been far less responsive to biotechnological manipulation. From the outset, it was molecular biologists and other scientists unfamiliar with agriculture and plant breeding who were most bullish on crop biotechnology. Most agricultural scientists have rightly remained skeptical.[36]

Plants—the ultimate source of all food—have been far less responsive to biotechnological manipulation.

Dr. Norman Borlaug, the plant breeder whose high-yielding wheats won him a Nobel Prize, recently pointed out that "the most productive applications of biotechnology and molecular genetics, in the near term, appear to be in medicine, animal sciences, and microbiology. . . . It will likely take considerably longer to develop biotechnological research techniques that will dramatically improve the production of our major crop species."[37]

Difficulties with identifying the gene or genes that code for particular crop characteristics, the unpredictable genetic variation that often occurs with gene transfer, and problems with tissue culture have all slowed the application of biotechnology to crops. Cereals—like all grasses—have been particularly resistant to genetic manipulation: they are not compatible with the bacterium most commonly used to introduce foreign genes into plant cells, and they are difficult to regenerate from altered cells. Only in 1988 did scientists succeed in transferring a foreign gene into a cereal crop, corn.[38]

Furthermore, once genes are transferred, conventional breeding techniques must still be used to evaluate the altered plants and make them suitable for distribution to farmers or for further breeding. The entire process—from gene transfer to dissemination of a new variety—can take as long as conventional breeding (typically 5–15 years). The new biotechnologies will allow scientists to specify the genetic structure of plants with increasing precision, but they will complement—not replace—plant breeding.[39]

Nonetheless, conventional breeding is limited to reproductively compatible species. Genetic engineering can bypass the reproductive barriers between species, giving plant breeders access to a new universe of genetic material. As the science advances, desirable qualities of unrelated plants will become available for transfer into crop species. Drought tolerance, nitrogen fixation, salt tolerance, and resistance to pests and disease are but a few often-mentioned possibilities.[40]

But it takes money to move genes. Economics and national and international policies will determine whether biotechnology can achieve its technical potential to provide more food for a hungry world.

Most of the money now going into biotechnology research comes not from public or philanthropic organizations but from multinational corporations. In the United States, industry spent an estimated $300 million on agricultural biotechnology research in 1987. The U.S. Department of Agriculture spent $85 million on such work in the same year—and an increasing share of such government funds are spent on basic research, while applied research is now often the province of industry or industry-supported university laboratories.[41]

At the international level, the Consultative Group on International Agricultural Research (CGIAR)—the principal international crop research organization funded by governments—devoted only an estimated $11.6 million (5 percent of its 1989 operating budget of $229 million) to biotechnology research. Of this, more than two thirds was devoted to animal research and less than a third to plants.[42]

U.S. biotechnology companies are fond of describing miracle crops that will feed hungry millions, and often use the promise of such immense benefits to attract investors and justify minimal regulation. But the application of biotechnology in the rich nations may not yield the rather prosaic miracles needed by small farmers in developing countries. Corporations will use biotechnology to develop crops and agricultural products they expect to be profitable and, if possible, which they can patent. Much of their effort, for example, is now focused on fruits and vegetables and on expensive flavoring and sweetener crops.[43]

Several of the larger agrichemical firms see the most potential profit in selling farmers integrated packages of seeds, fertilizer, and pesticides. In conjunction with subsidiary or affiliated seed companies, they are combining research on chemicals and plants, developing crop varieties that will be compatible with their own products. Although pest and disease resistance are commonly touted as major goals in corporate crop development programs, resistance to herbicides—which will in fact increase the use of these chemicals—is receiving R&D priority.[44]

Chemical herbicides substitute for tillage, the traditional method of controlling weeds; they increase crop yields only if previous weed control methods were inadequate. No-till farming—which means fewer tractor trips through a farmer's field—can substantially reduce fuel use and soil erosion, but its reliance on herbicides poses greater risk of contaminated groundwater and adverse effects on wildlife. Some herbicides are toxic or carcinogenic, and questions remain about the safety of even the "new-generation" herbicides.[45]

Moreover, herbicides offer little to farmers in developing countries, where most of the world's hungry people live. Hand weeding is cheaper, because labor is both abundant and inexpensive, and it is safer than using chemicals. Herbicides make economic sense in high-capital agriculture and when labor costs are high; in most developing-country farming areas, the opposite situation exists.[46]

Similarly, bovine growth hormone (BGH)—one of the first animal biotechnology products to be commercialized, and one that can increase cows' milk production by as much as 10–25 percent—is not a practical technology for most livestock owners in the Third World. At roughly $100 per cow, BGH will cost as much per year as many people in developing countries spend on food. In addition, treated animals will require large, high-quality, consistent rations of feed, and frequent injections—hardly a practical technique in countries where vaccinations of humans for infectious diseases are still far from routine.[47]

Corporate biotechnology research is likely to lead to useful products for developing countries only if governments, private foundations, and international agencies have the opportunity—and the funding—to license corporate technologies. Ironically, such spinoffs are only likely to occur in crops for which corporations perceive little economic market. For example, corporate-funded research on resistance to viral diseases in tobacco, tomato, and other species has yielded techniques useful for developing similar resistance in Third World crops such as cassava, yields of which are widely reduced by viruses.[48]

Allowing corporations to gain exclusive rights to the discoveries of university scientists has a chilling effect on the exchange of scientific information.

Thus, public funding for applied biotechnology research is extremely important at both the national and the international level. Unfortunately, public budgets for applied research are inadequate and shrinking even in the countries where biotechnology was pioneered.[49]

The danger of relinquishing this technology to the private sector is that the private sector will set the research agenda. Public money has directly and indirectly supported the development of biotechnology in public institutions. Allowing corporations to gain exclusive rights to the discoveries of university scientists in return for marginal contributions to the total research budget has a chilling effect on the exchange of scientific information and genetic materials, and skews research priorities.[50]

The international agricultural research centers—the institutions most likely to address the needs of farmers in developing countries—also deserve more support. CGIAR centers already use biotechnology techniques such as genetic probes, cell fusion, and tissue culture to detect plant diseases, introduce disease resistance into existing varieties, and create disease-free plants for distribution to farmers. But such research is only a small part of their overall international research, education, and extension effort.[51]

Most important in international agricultural research is a clear vision of priorities. Through their experience with the Green Revolution's successes and failures, the CGIAR centers are far better equipped than the private sector to develop crops and agricultural products that help feed the hungriest people rather than exacerbating existing nutritional inequities.

Ideally, the CGIAR system could develop new crop varieties, work with scientists in non-CGIAR international research centers, and train scientists from developing countries in biotechnology, thus improving national and regional crop development programs. This is already happening to some extent, but additional support for agricultural research is needed. The weakest links in the chain are between the international research centers, developing-country governments, and the farmers they ultimately serve.[52]

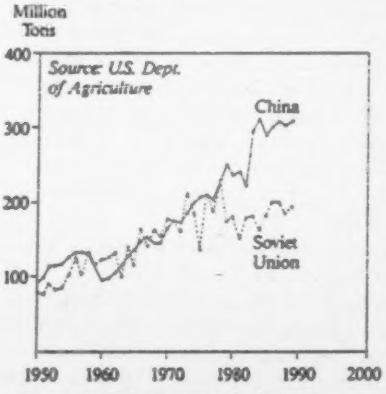
Controversy over genetic resources and their control could impede the development of biotechnology for developing countries. Realizing that the genes from native plants may be used to develop substitutes for their exports or be sold back to them in new products at high prices, developing countries have become understandably reluctant to allow unrestricted access to their genetic heritage. Though direct compensation schemes may be impractical, it is only just that industrial nations support development of biotechnology to feed the Third World—in full partnership with those countries.[53]

Furthermore, all private and public efforts in biotechnology will be undermined if the current wave of plant and animal extinctions goes unchecked. If the diversity of both crop and noncrop species is not safeguarded, much of the raw material now available for genetic manipulation will be lost. Biotechnology can move genes, but its ability to create them is virtually nonexistent.

THE SOVIET AGRICULTURAL PROSPECT

Efforts to identify possible dramatic gains in world food output in the near future often focus on the Soviet Union because of its recently announced program to reform agriculture by shifting to a market-oriented farm economy, with prices keyed to those of the rest of the world. Expectations are high for two reasons: the frequently made comparison between the productivity of private plots and of state farms, and the record-setting gains in China's agricultural output after reforms were adopted there a decade ago. (See Figure 4–3.)

Comparisons of the productivity on private plots with that of state farms are often more ideological than analytical, and hence misleading in several respects. First, private plots often grow specialty crops, rather than staples. Measuring the productivity of a household



Source: U.S. Dept. of Agriculture

Figure 4-3. Grain Output in the Soviet Union and China, 1950–89

garden plot on a Montana ranch against that of its wheat fields would yield comparative data similar to those frequently cited for the Soviet Union. The garden plot, carefully tended and watered with a garden hose and producing strawberries, tomatoes, and lettuce, would get a return per hectare many times that of the surrounding wheat fields.

Regarding the second source of hope, it is true that the agricultural reforms launched in China more than a decade ago and those recently set in motion in the Soviet Union have a common purpose—to raise output by strengthening the link between effort and reward. But there are several key differences. Many Chinese working on the land today managed family farms before the collectivization that followed the revolution in 1949. Since the Soviet revolution occurred much earlier, few people in that country remember how private farms operate in a market economy.

Given the enormous size of Soviet agricultural operations today, those who work on state and collective farms occupy highly specialized roles. Some drive tractors. Others milk cows. Some are bookkeepers. Others are mechanics responsible for equipment maintenance. A few people at the senior management level have some understanding of all phases of agricultural production and marketing, but they are in the minority. Farming requires an understanding of many things: land management, plant pathology, animal nutrition, agricultural mechanics, and marketing, to cite a few. Most Soviet farm workers lack this range of skills.

In contrast to agriculture in China, farming in the Soviet Union is highly mechanized, using heavy equipment not suited for family-sized production units. Time will be required to "tool up" manufacturing facilities to produce farm equipment more suited to smaller family-farm units.

Another key difference is the rate of fertilizer use. In both countries, reforms involve moving toward world market prices for agricultural inputs and farm products. Once these prices are established, the use of fertilizer will be adjusted to maximize profits. Farmers throughout the world facing the same crop prices and fertilizer costs will use similar amounts of fertilizer under similar conditions. Because fertilizer use in the mid-seventies in China was low by international standards, the reforms resulted in a sharp jump, accompanied by an impressive increase in grain output of nearly half between 1976 and 1984.[54]

In contrast, fertilizer use in the Soviet Union is already heavy due to high subsidies. The extent of overuse can be seen in the fertilizer-grain response ratios there compared with other grain-producing countries. In the United States, China, and India, where prices are keyed to the world market, farmers get 16 to 18 tons of grain for every ton of fertilizer used. (See Table 4–6.) In the Soviet Union, farmers get 8 tons of grain for each ton of fertilizer.

As Soviet agriculture moves toward the adoption of world market prices, the amount of fertilizer that can be profitably applied is likely to decline. Indeed, partial withdrawal of fertilizer subsidies actually reduced fertilizer use in some Soviet republics in 1988. A further reduction of subsidies in 1989 appears to have lowered fertilizer use nationwide. Although this did not measurably lower production, it does mean that the principal source of the growth in China's grain output following the reforms will not be operating at all in the Soviet Union.[55]

Nor is there likely to be much growth in net irrigated area in the Soviet Union in the years ahead. Barring the unlikely prospect of reviving the plan to divert southward the rivers that empty into the Arctic Sea, there is little hope of much irrigation expansion. (See Chapter 3.)

Table 4-6. Grain Production and Fertilizer Use in World's Four Leading Grain-Producing Countries, 1986

Country	Grain Production	Fertilizer Use	Grain Produced Per Ton of Fertilizer
	(million tons)		(tons)
China	300	16.9	18
India	137	8.5	16
Soviet Union	202	25.4	8
United States	314	17.8	18

SOURCES: Grain production from U.S. Department of Agriculture, Economic Research Service, *World Grain Harvested Area, Production, and Yield, 1950–88* (unpublished printout) (Washington, D.C.: 1989); fertilizer use from U.N. Food and Agriculture Organization, *FAO Quarterly Bulletin of Statistics*, Vol. 1, No. 3, 1988.

Soviet agriculture is also plagued by its extreme northerly location. Moscow lies at roughly the same latitude as Canada's Hudson Bay, and Leningrad is actually in line with southern Alaska. The nation's climatic regime in terms of soils, rainfall, and solar intensity is thus much more similar to Canada's than to that in the United States.[56]

Crop production potential, like tree growth rates, is much lower in extreme northerly regimes than in the middle latitudes. It is more appropriate, therefore, to compare Soviet agricultural productivity with that of Canada than with that of the United States or China. Soviet wheat yields during the 1985–88 period averaged 1.7 metric tons per hectare, only slightly less than the 1.8 metric tons of Canada, where croplands are newer and less eroded.[57]

References in Soviet agricultural circles to an unfolding ecological catastrophe are becoming commonplace.

As information on agricultural conditions in the Soviet Union becomes more readily available, evidence of widespread environmental degradation is mounting. Difficulties with the irrigation complex around the Aral Sea, which accounts for nearly 40 percent of Soviet irrigated land, may eventually cause the irrigated area in this region to contract.[58]

But the most serious threat to agricultural productivity may well be soil erosion and land degradation. With the largest unbroken expanses of cropland in the world and with little in the way of hedges, tree breaks, or other natural vegetation to interfere, wind and water erosion are taking a heavy toll. One Soviet academician believes this has reduced the inherent productivity of Soviet cropland an average of 30 percent.[59]

The extent of topsoil loss is staggering, and references in Soviet agricultural circles to an unfolding ecological catastrophe are becoming commonplace. An estimated 100,000 hectares of cropland are now claimed annually by an expanding network of gullies cutting through the land. Yuri Markish, a USDA analyst of Soviet agriculture, uses official Soviet sources to conclude that 152 million hectares, roughly two thirds of the arable land, has lost fertility as a result of water and wind erosion. This helps explain why Soviet grain output has increased little since 1980, even though fertilizer use has increased by more than half.[60]

Although the Soviet Union invests far

more in agriculture than any other country does, the returns on its investment have been disappointing. Indeed, the intensive agriculture program, patterned after the agricultural successes in Western Europe and designed to provide a complete package of inputs for use on the more productive land, has yielded only modest gains in output. Unfortunately, these are all too often offset by production losses resulting from soil erosion, soil compaction, and the waterlogging and salting of irrigation systems.[61]

The entire world has a stake in the success of Soviet agricultural reforms, but consumption gains will probably be limited, and are more likely to come from reducing waste than from expanding output. Soviet farmers face the difficult task of feeding a population of 289 million, who aspire to a much better diet and whose numbers are expanding by 3 million per year, with a steadily deteriorating resource base. Expectations that agricultural reforms will quickly end Soviet dependence on imported grain, perhaps even making it an exporter, are not realistic.[62]

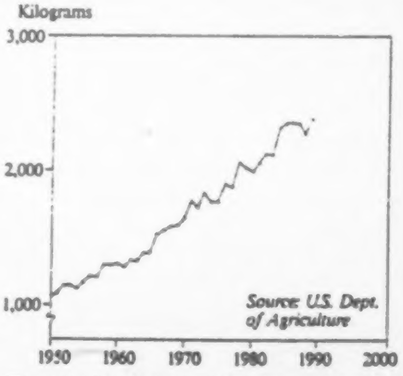
A TOUGH DECADE AHEAD

Projecting future food production was once a simple matter of extrapolating historical trends. But as yields in many countries approach the upper bend on the S-shaped growth curve, this approach becomes irrelevant. The grain outputs of several countries, including China, Indonesia, Mexico, and the Soviet Union, have shown little or no growth since 1984. In addition, land degradation and hotter summers—the former difficult to measure and the latter impossible to project with precision—will shape future production trends.[63]

In one respect, projections are simpler now than in the past. Since the cultivated area is not likely to change appreciably during the nineties, assessing the production prospect becomes solely a matter of estimating how fast land productivity will rise. Historically, the largest gain in world cropland productivity, as measured by grain yield per hectare, came during the sixties, when it climbed 26 percent over the decade. It rose only 21 percent during the seventies, and an estimated 20 percent in the eighties.[64]

Given the adverse effects of environmental degradation discussed in this chapter, it seems likely that the rise in world cropland productivity will slow further during the nineties. Perhaps as a harbinger of the future slowdown, it increased very little between 1984 and 1989. (See Figure 4-4.) At this point, it is difficult to know whether this recent plateau is merely a short-term interruption in a long-term trend that will soon resume its vigorous climb, or an indication of how difficult it has become to continue raising land productivity rapidly in countries where yields are already high and in a world where environmental degradation is reducing production potential.[65]

For example, since 1950 U.S. corn yields and West European wheat yields



Source: U.S. Dept. of Agriculture

Figure 4-4. World Grain Yield Per Hectare, 1950-89

have nearly tripled. In the Third World, wheat yields in India have more than doubled since 1965, and rice yields in China have more than doubled since 1960. Obviously countries cannot continue doubling and tripling grain yield per hectare every few decades. But what kind of further increases can reasonably be expected? And how quickly will they come?[66]

Trends in land productivity in Japan may help answer these questions. Grain yields there started their long upward climb around 1880, several decades before those in other countries. The world grain yield today, taking into account the wide range of growing conditions, appears to be roughly where Japan's yields were in 1970. For instance, the 1989 rice yield in China, the world's largest rice producer, was an estimated 3.8 tons of milled rice per hectare, exactly the same as Japan's rice yield in 1970. Today, yield per hectare of corn in the United States is nearly double that of rice in Japan in 1970. The yield of wheat in Western Europe is currently a fourth again as high. On the other end of the scale, 1989 rice yields in India were less than half those of Japan in 1970.[67]

Since 1970, Japan's rice yield per acre has risen an average of 0.9 percent per year, scarcely half the 1.7 percent projected annual growth in world population during the nineties. If the world can raise yields during the nineties at this rate, then grain output will increase by 158 million tons, an overall gain of 9 percent. But with world population expected to increase by more than 959 million (18 percent), per capita grain production would fall 7 percent during the decade. (See Table 4–7.) If the world cannot do any better over the next decade than Japan has over the last two, in other words, a steady deterioration of

Table 4-7. World Grain Production, Total and Per Capita, 1950–80, With Projections to 2000

	World Grain Production			Per Capita		
Year	Total	Change Per Decade		Total	Change Per Decade	
	(million tons)	(million tons)	(percent)	(kilograms)	(kilograms)	(percent)
1950	631			246		
1960	847	+216	+34	278	+32	+13
1970	1,103	+256	+30	296	+18	+ 6
1980	1,441	+338	+31	322	+26	+ 9
1990	1.684[1]	+243	+17	316	− 6	− 2
2000	1,842[2]	+158	+ 9	295	−21	− 7

[1] Assumes 1 percent increase over 1989 world harvest of 1.667 million metric tons as estimated by USDA in October 1989. [2] Assumes no appreciable gains or losses in world grain area and a rate of yield-per-hectare increase for world grain between 1990 and 2000 that will equal the 0.9 percent per year increase in Japan's rice yield between 1969–71 and 1986–88.

SOURCES: Grain production 1950–80 from U.S. Department of Agriculture (USDA), Economic Research Service (ERS), *World Grain Harvested Area, Production, and Yield, 1950–88* (unpublished printout) (Washington, D.C.: 1989); 1989 from USDA, World Agricultural Outlook Board, *World Agriculture Supply and Demand Estimates*, Washington, D.C., October 12, 1989; per capita figures derived from population data (based on data from U.S. Bureau of the Census) in Francis Urban and Philip Rose, *World Population by Country and Region, 1950–86, and Projections to 2000* (Washington, D.C.: USDA, ERS, 1988); increase in Japanese rice yield from USDA, ERS, *World Grain*.

diets for much of humanity and increasing hunger for many of us seems inevitable.[68]

The key question for the nineties is whether the world will even be able to match the Japanese record. Despite the powerful incentive of a domestic price support for their rice pegged at four times the world market, Japanese farmers have run out of agronomic options to achieve major additional gains in productivity. Farmers in the rest of the world—who are not as literate or as scientifically oriented as those in Japan—will find it difficult to do any better.[69]

A deterioration in diet and an increase in hunger for part of humanity is no longer a matter of conjecture. In Africa, both the absolute number of people and the share of population that is hungry are increasing. In Latin America, increasing poverty, declining food production per person, and rising food prices indicate a similar trend. Progress in reducing infant mortality, the most sensitive indicator of a society's nutritional state, has been slowed, stopped, or reversed in dozens of countries.[70]

If the world continues with business-as-usual policies in agriculture and family planning, a food emergency within a matter of years may be inevitable. It would extend beyond low-income people in the Third World, with its repercussions affecting the entire world. Soaring grain prices and ensuing food riots could both destabilize national governments and threaten the integrity of the international monetary system.

Barring any dramatic technological breakthroughs on the food front, the widening of the gap between population growth and food production of the last several years will continue. In all too many countries, the opportunity to slow population growth with the time bought on the food front by the Green Revolution has been wasted. To be sure, there will be some further gains in output from high-yielding crop varieties, but they are not likely to match the impressive jumps registered from the mid-sixties to the mid-eighties.

The world needs to continue to strengthen agriculture in every way possible. A massive international effort is needed to protect soil, conserve water, and restore the productivity of degraded land. But the Japanese experience suggests that even doing everything feasible on the food side of the food/population equation is not enough.

A massive international effort is needed to protect soil, conserve water, and restore the productivity of degraded land.

Feeding people adequately in the nineties will depend on quickly slowing world population growth to bring it in line with the likely increase in food output. The only reasonable goal will be to try to cut the growth rate in half, essentially doing what Japan did in the fifties and what China did in the seventies. Reaching that goal depends on raising public understanding of the relationship between family size today and the quality of human existence tomorrow. Unless these goals are given top priority in national capitals, the effort will fail.[71]

Nor is a family planning effort of the magnitude needed likely to succeed if the international community does not effectively address the issue of Third World debt. The economic and social progress that normally leads to smaller families is now missing in many debt-ridden countries. Unless debt can be reduced to the point where economic progress resumes, the needed decline in fertility may not materialize.

Launching an adequate international population campaign might best be done through a U.N. conference for the world's political leaders. Such a gathering would permit an examination of the loss of momentum on the food front and a review of the shifting balance between food supplies and population. It could also lead to an examination of national and global projections so that people everywhere can better understand the consequences for the hungry—and for the world—of continuing on the current demographic path.

Notes

Chapter 1. The Illusion of Progress

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30. Population data from Urban and Rose, *World Population*.

31. See Chapter 4 for further discussion of food production and food security; grain production from USDA, ERS, *World Grain*; grain prices from IMF, *International Financial Statistics*, Washington, D.C., monthly various issues.

32. World grain production from USDA, ERS, *World Grain*, except 1989 from USDA, WAOB, *Supply and Demand Estimates*.

33. World grain production from USDA, ERS, *World Grain*, except 1989 from USDA, WAOB, *Supply and Demand Estimates*; grain prices from IMF, *International Financial Statistics*; U.S. idled cropland from Karmen, private communication.

34. Fertilizer consumption 1984–87 from FAO, *FAO Quarterly Bulletin of Statistics*, Vol. 1, No. 2, 1988; 1988 from Fertilizer Institute, *Fertilizer Facts and Figures 1989* (Washington, D.C.: 1989); 1989 is author's estimate.

35. World grain consumption was an estimated 322 kilograms per capita in 1989, so the additional 88 million people that year would need 28 million tons of grain; figure derived from consumption estimate in USDA, WAOB, *Supply and Demand Estimates*, and from population estimate in Urban and Rose, *World Population*.

36. Malnutrition information from UNICEF, *State of the World's Children 1989*; declining food aid from USDA, ERS, *World Food Needs and Availabilities, 1988/89: Fall* (Washington, D.C.: 1988), and from Ray Nightingale et al., "Higher Prices Strain Food Aid Budgets," *Agricultural Outlook*, USDA, ERS, Washington, D.C., September 1989.

37. Grain stocks and production from USDA, FAS, *World Grain Situation and Outlook*; countries that import U.S. grain from USDA, ERS, *World Agricultural Trends and Indicators, 1970–88* (Washington, D.C.: 1989).

38. Grain fed to livestock from USDA, FAS, *World Wheat and Coarse Grains Reference Tables*, and from Gerald Ostrowski, USDA, FAS, Washington, D.C., private communication, September 1989.

39. U.N. World Food Council (WFC), "The Global State of Hunger and Malnutrition: 1988 Report," 14th Ministerial Session, Nicosia, Cyprus, March 24, 1988.

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Chapter 4. Feeding the World in the Nineties

1. U.N. World Food Council (WFC), "The Global State of Hunger and Malnutrition: 1988 Report," 14th Ministerial Session, Nicosia, Cyprus, March 24, 1988.

2. Grain stocks from U.S. Department of Agriculture (USDA), Foreign Agricultural Service (FAS), *World Grain Situation and Outlook*, Washington, D.C., October 1989; grain price changes calculated in constant dollars, using prices in International Monetary Fund (IMF), *International Financial Statistics*, Washington, D.C., various issues, and deflators in U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, Washington, D.C., various issues.

3. USDA, FAS, *World Grain Situation and Outlook*, October 1989.

4. Francis Urban and Philip Rose, *World Population by Country and Region, 1950–86, and Projections to 2050* (Washington, D.C.: USDA, Economic Research Service (ERS), 1988).

5. Estimate of cropland affected by soil erosion from Lester R. Brown and Edward C. Wolf, *Soil Erosion: Quiet Crisis in the World Economy*, Worldwatch Paper 60 (Washington, D.C.: Worldwatch Institute, September 1984).

6. Robert J.L. Hawke, Prime Minister of Australia, "Speech by the Prime Minister: Launch of Statement on the Environment," Wentworth, N.S.W., Australia, July 20, 1989; *Pravda* cited in Yuri Markish, "Soviet Environmental Problems Mount," *CPE Agriculture Report* (Washington, D.C.: USDA, ERS), May/June 1989; Government of India, "Strategies, Structures, Policies: National Wastelands- Development Board," New Delhi, mimeographed, February 6, 1986.

7. Annual soil erosion figure is authors' estimate, based on Brown and Wolf, *Soil Erosion*; assuming an average topsoil depth of 18 centimeters, 156 tons of soil per hectare-centimeter, and 24 million hectares each in corn, wheat, and soybean land, there are 202 billion tons of soil on such land in the United States; area figures are typical for the eighties and are from USDA, ERS, *World Grain Harvested Area, Production, and Yield, 1950–88* (unpublished printout) (Washington, D.C., 1989) (for wheat and corn), and from USDA, FAS, *World Oilseed Situation and Market Highlights*, September 1989 (for soybeans).

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Senator **Fowler**. We will welcome Dr. Bruce Gardner, the Assistant Secretary for Economics at USDA. Is Mr. Gray with you? We welcome him to the table, if Mr. Mack Gray wants to come, Assistant to the Chief for Strategic Planning and Budget Analysis at the Soil Conservation Service. Mr. Secretary, thank you for being with us. Your full statement will be made a part of the record, and you can either accept the challenge of the Senator from Washington or read your statement. [Laughter.]

STATEMENT OF BRUCE L. GARDNER, ASSISTANT SECRETARY FOR ECONOMICS, U.S. DEPARTMENT OF AGRICULTURE, WASHINGTON, DC; ACCOMPANIED BY R. MACK GRAY, ASSISTANT TO THE CHIEF FOR STRATEGIC PLANNING AND BUDGET ANALYSIS, SOIL CONSERVATION SERVICE, U.S. DEPARTMENT OF AGRICULTURE, WASHINGTON, DC

Mr. **Gardner**. Thank you, Mr. Chairman, members of the subcommittee.

INTRODUCTION

I appreciate the opportunity to discuss conservation issues in the 1990 farm bill, and I will summarize my remarks, but with some hesitation I say that I will read the summary.

Senator **Fowler**. That is fine.

FIRST, WHY DO WE NEED A CONSERVATION TITLE IN THE FARM BILL?

Mr. **Gardner**. First, why do we need a conservation title in the farm bill? I would just like to rehearse that issue for a minute. The purpose is to improve the environment for farmers and for the rest of us and to maintain the productive capacity of agriculture for future generations. At the same time we have to keep in mind the overall objective of farm policy, to promote an economically healthy agriculture and an internationally competitive one, and moreover, we have to try to achieve these objectives at the minimum possible cost to the taxpayer.

The 1985 act made several significant innovations in promoting conservation and environmental goals. The provisions that were most significant in the 1985 act were the conservation reserve or CRP program, the so-called swampbuster provision, and the sodbuster and conservation compliance provisions. The details on these provisions, or at least some of the details, are provided in the written testimony. These provisions had to be adjusted in several respects during the life of the 1985 act as they turned out to be administratively too cumbersome or to have unexpected consequences. Further adjustments are in order.

CHANGES THAT WE PROPOSE FOR THE 1990 FARM BILL

The main changes that we propose for the 1990 farm bill are as follows:

First, we would like to go further in the direction that the CRP has already begun of targeting CRP acreage to a broader range of environmental and conservation purposes than the early conservation on soil erosion. These broader purposes include wetlands enhancement, ground and surface water quality, reforestation and the promotion of wildlife habitat. We believe that these objectives can be adequately met by a more specific targeting of the remaining 6 million acres in the 40 million acre CRP total that originally was established in the 1985 act. We do not recommend going above 40 million acres in the CRP. Why not? It is a question of balance among the objectives that I listed earlier. No doubt additional acreage in the CRP planted to trees, say, or removing even more erodible land, would have environmental and conservation benefits. But the costs would mount up to the point that we do not believe they justify the benefits to society. The budgetary costs could be substantial. For example, another 5 million acres at $50 an acre, which is the average rate we have paid in the past, a $50 per acre rental fee for 10 years would add up to $2.5 billion. Moreover, at this point, the CRP is getting large enough that it would have some potential to reduce our international competitiveness. As we add more acreage to the CRP, we get successively closer to enrolling the more highly productive acreage that should rightfully be used in agricultural production and not removed for conservation purposes.

With respect to the swampbuster and sodbuster and the conservation compliance, we propose some marginal but significant changes in the 1985 act provisions that are listed in the green book in the testimony, and I will not go through them here. The more significant departure perhaps is with respect to the annual acreage reduction programs. Here we propose a multiyear set-aside in which a producer would be required to place half of the farmer's ARP land in annual or perennial cover crops. If perennial cover is chosen, we would cost-share 50 percent of the cost of establishing the cover crop up to a maximum of 5 percent of the acreage base one time in a 5-year period.

We think this perennial cover is worth encouraging because it provides better environmental protection and wildlife habitat benefits than annual cover or the practices now allowed of simply controlling weeds.

Our flexibility proposal also is intended to give some encouragement to conservation by allowing a producer to keep deficiency payments in base for future payments if a conserving crop is grown but not harvested on the NCA acreage of a farm.

Finally, we propose that goals of sustainable agriculture be promoted by research and educational efforts which we plan to maintain and even accelerate somewhat. But we do not propose any sort of regulatory or financial encouragement of one type of farming over another.

CONCLUSION

We are also opposed to the recommendations of some that farmers be required to maintain detailed records of pesticide or other chemical use. We do believe the data on these activities are valuable and even essential. Indeed, our food safety initiative in the President's fiscal year 1991 budget contains $25 million to be used to begin to establish a scientifically solid data base on pesticide use and residues on food products. We believe that these data are best obtained through the statistically well-established procedures that we now use in gathering other crop and price statistics and that requiring farmers to keep records is not the appropriate way to obtain such data either from the farmer's point of view or from the government's.

With that, let me try to answer any questions you may have.

[The prepared statement of Mr. Gardner follows:]

Statement of
Bruce Gardner
Assistant Secretary for Economics
United States Department of Agriculture

before the
Conservation and Forestry Subcommittee
of the
Committee on Agriculture
United States Senate

Concerning Conservation Issues of the 1990 Farm Bill
March 29, 1990

MR CHAIRMAN AND MEMBERS OF THE SUBCOMMITTEE

I am pleased to have the opportunity to review progress that has been made in implementing the conservation provisions of the 1985 Food Security Act, and to present the Administration's proposals for the 1990 Farm Bill which build on the accomplishments of the 1985 Act.

Passage of the Food Security Act of 1985 dramatically changed this nation's approach to soil, water, and wetland conservation. For the first time in history, receipt of most federal farm program benefits — commodity price supports, agricultural credit, and crop insurance — became legally contingent on the application of land stewardship practices by agricultural producers. The Conservation Title and its main provisions — encompassing conservation reserve, swampbuster, sodbuster, and conservation compliance — also changed the programs and program priorities of federal soil and water conservation agencies and their cooperators at the state and local levels.

The Conservation Title was enacted in part because of the shared belief within much of the agricultural and environmental communities that federal farm programs should promote natural resource conservation and not operate at cross purposes with conservation goals.

Three so-called compliance provisions in the Conservation Title establish this linkage:

- swampbuster, which prohibits the conversion of wetlands to annual crop production as a condition of eligibility for farm program benefits;
- sodbuster, which makes receipt of the same benefits contingent on the application of a conservation plan whenever highly erodible land is broken out for cropping purposes; and
- conservation compliance, which likewise requires implementation of a conservation plan by producers who wish to continue farming highly erodible land while receiving farm program benefits.

Although the flexibility recommendation in the Administration's 1990 Farm Bill proposal is not a direct part of the conservation and environment section, it will benefit soil and water conservation and improve environmental quality by reducing the incentive to use chemical and land resources simply to capture subsidies, and by encouraging future use of rotations involving conserving crops.

Under our proposals, farmers would no longer be required to plant highly erodible or other fragile croplands in order to maintain their base, and yet they would still have access to the income protection programs of the federal government. We believe that neutralizing subsidy payments among program crops will encourage producers to make better economic and environmental cropping choices.

Conservation Reserve Program

The Conservation Reserve Program (CRP), gives producers an incentive to retire highly erodible cropland and other fragile land from production for a period of 10 years. Producers who enroll cropland in the CRP receive an annual rental payment for idling the land and cost-share assistance for establishing and maintaining a permanent vegetative cover on the CRP acres for erosion control and other environmental improvement purposes.

The conservation reserve provision was based on knowledge gained from completion of the 1977 and 1982 National Resources Inventories which showed, for the first time, that a high percentage of total wind and water erosion on U.S. cropland was occurring on a small percentage of the land.

Almost 34 million acres of land have been enrolled in the program to date. We estimate that when cover has been established on these acres, erosion from cropland will have been reduced by more than 650 million tons annually. This reduction amounts to over 20 percent of the erosion occurring annually on cropland in the U.S. It will have resulted from a CRP enrollment of only 8 percent of the nation's cropland.

The CRP has also been the largest tree planting program in history, even exceeding the soil bank program of the 1960's. Through the ninth signup, more than 2.1 million acres have either been planted, or have been scheduled for planting, to trees.

Filter strips, established under CRP, will protect over 6,100 miles of streams and water bodies from sediment and other pollutants from cropped fields.

Over 400,000 acres have been enrolled in the CRP under the cropped wetlands criteria. About 83,000 of these wetland acres will be devoted to trees.

Conservation Compliance

Implementation of the conservation compliance provision is proceeding on schedule. The Soil Conservation Service assisted producers in developing conservation plans on between 1.4 and 1.5 million farms covering over 135 million acres of highly erodible land. These plans, when implemented, will reduce erosion on highly erodible lands by about 50 percent annually. Farmers must be actively applying their plans between January 1, 1990 and the end of 1994 at which time the plans must be completely applied.

Implementation of the plans will represent a major conservation effort by our nation's farmers. The plans contain over 215,000 miles of terraces, 1.3 million acres of grassed waterways, 4,700 miles of diversions, 25 million acres of contouring, and more than 100 million acres of conservation tillage.

Swampbuster

The swampbuster provision helps protect the nation's wetlands by denying federal farm program benefits to producers who plant an agricultural commodity on wetlands converted after December 23, 1985. The program regulations cover temporary wetlands on cropland as well as those that are still covered by hydrophytic vegetation. A recent evaluation by the Soil and Water Conservation Society concluded that wetland conversion had slowed because of swampbuster but that some agricultural conversion may still be taking place.

Through April of 1989, ASCS had formally notified 427 producers of ineligibility for Department of Agriculture program benefits because of noncompliance with the swampbuster provisions of the 1985 Act. Of those 427 producers who received formal notices of ineligibility, 393 filed appeals or requests for reconsideration. Through the administrative appeal process, 243 determinations were resolved in favor of the appellant and 71 determinations were sustained. Resolution of the remaining 79 were pending at the time of the report. We are now in the process of updating this information.

The actual number of benefit denials is less important than the fact that producers are convinced that the provisions will be aggressively and effectively implemented and that conversions are discouraged.

Sodbuster

The purpose of the sodbuster provision is to discourage the conversion of highly erodible land to cropland and to assure that converted lands are protected from erosion by the application of sound conservation systems.

Implementation of the sodbuster provision is accomplishing the desired objective. The rules and regulations require that very stringent requirements be met for conservation systems on land converted to cropland from trees or native sod. The rate of conversion of native grass and forest land has slowed. While it will always be difficult to determine with certainty the total number of acres of highly erodible land that might have been converted in the absence of the sodbuster provision, a review of conversion rates leads to the conclusion that the provision is effective. Over 500 producers have had program benefits denied because of sodbuster violations. Again, I would stress that the actual number of program benefit denials is less

important than the fact that producers are convinced that the provision will be aggressively and effectively implemented and that conversions are discouraged.

Conservation Reserve Program Recommendations

The General Accounting Office and others have commented that the concentration of CRP enrollment in the Western Great Plains has limited the potential of the CRP in meeting some of its objectives such as water quality, wildlife habitat, wetland protection and restoration, and reforestation. We agree that the CRP could be refocused to obtain greater environmental benefits. We are therefore proposing to amend the Conservation Reserve Program.

The Administration proposal would:

- Amend the Food Security Act of 1985 to permit the Secretary to enter into contracts with producers during crop years 1991 through 1995.

- Protect the producer's crop acreage base and acreage allotment beyond the end of the contract period so long as the producer continues to leave the land in a protective cover of grass or trees. The bases and allotments would be protected and continued to be held in abeyance as has been the case during the contract. Currently, producers have an incentive to return CRP land to cropping at the end of the contract period to protect their original base and allotment acreage.

- For future contracts, require that land enrolled in CRP meet the soil loss tolerance level ("T" value) if returned to cropping at the end of the contract period. This will discourage returning the most fragile and least productive CRP land to crop production.

- **Allow windbreaks and shelter belts into the CRP without requiring enrollment of whole fields. This will reduce rental costs and produce long-term benefits because producers will maintain the measure long after the contract expires.**

- Provide that the program as amended not exceed a total of 40 million acres.

Wetlands Recommendations

Wetlands are productive and valuable national resources. They constitute habitat crucial to many forms of wildlife and are also important in maintaining ground water supplies and water quality, in protecting shorelines from erosion, in storing floodwaters, and in trapping sediments.

Existing federal programs that help protect wetlands include the Water Bank Program, the Clean Water Act's section 404 Wetland Permit Program, and the Food Security Act of 1985. The swampbuster provision of the Food Security Act discourages draining of wetlands for agricultural production. Farmed wetlands are currently eligible for the Conservation Reserve Program.

The National Wetland Priority Conservation Plan required by the Emergency Wetland Resources Act of 1986 and the North American Waterfowl Management Plan signed by the U.S. and Canada both call for increased acquisition and restoration of wetlands. The National Wetlands Public Forum recommended implementing an Agricultural Wetlands Reserve Program to fund permanent easements and restoration of 2.5 million acres of wetlands previously converted to agriculture.

We recommend that the 1990 Farm Bill provide for extension of the current CRP time period for which contracts may be entered into for the purpose of restoring and protecting cropped wetlands.

- **Lands eligible for contract beyond 1990 may include:**
    - Existing cropped wetlands; and
    - Restorable previously converted wetlands where the values of the restored land and the probability of successful restoration are both high and the cost of restoration would not be excessive.

- Producers may be offered permanent easements on the land under contract.

- Producers who give a permanent easement would be able to choose to receive either 10 annual payments or one up-front payment not to exceed the fair market value of the property.

- The Secretary will, to the extent possible, allocate at least 10 percent of the new reserve acres to wetland protection and restoration through wetland permanent easements.

Water Quality Recommendations

As progress has been made in cleaning up point sources of pollution, the relative importance of nonpoint sources, including agriculture, has increased. State water agencies indicate that agricultural nonpoint sources are contributing to river and lake degradation. Pesticide contamination was reported to adversely affect some water in almost one-fifth of all counties in the U.S.

In recent years, concerns about ground water increased as surveys have detected levels of nitrate and trace amounts of pesticides in some aquifers. Environmental factors influence the potential for agricultural chemicals to accumulate in ground water. Contamination is more likely to occur in areas where the soils are sandy and highly permeable with little organic matter, areas with enough rainfall or irrigation water for potential deep leaching, or areas located over shallow, unconfined aquifers.

Our proposal to extend the CRP would enable producers to reduce cropping on land where pollution of ground water is a critical concern.

- Land eligible for contract beyond 1990 could include areas such as:
    - All cropland within 1,000 feet of a well within a state-approved wellhead protection area;
    - Cropland in shallow karst areas, where sinkholes convey runoff directly to ground water;
    - Critical cropland areas within hydrologic units identified in state water quality plans as having priority problems resulting from agricultural nonpoint sources;
    - Cropland areas where agricultural nonpoint sources have been documented to pose a significant threat to the quality of habitat for federally listed threatened or endangered species;
    - Filter strips; and
    - Other lands on which the Secretary determines that the potential for water pollution resulting from continued agricultural production justifies retirement from cropping.

- The Secretary would be authorized to permit more than 25 percent of the cropland in a county to be entered in the program if he determined that the potential risk to water quality posed by continued cropping outweighed the adverse impacts that retiring cropland would have on the local economy.

- Producers could be offered the option of signing either 10-year contracts or giving permanent easements of the land under contract. The fair market value of a permanent easement could not exceed the value of the property.

- The Secretary will, to the extent possible, encourage the use of permanent easements.

Sustainable Agriculture Recommendations

Sustainable agriculture generally means an agriculture that, for the foreseeable future, will be productive, competitive, profitable, conserve natural resources, help protect the environment, and enhance public health and safety. Sustainable agricultural systems make use of components such as crop rotations, conservation tillage systems, new plant varieties, and improved methods for quantifying nutrient needs of crops.

There is a consensus that existing commodity program provisions tend to discourage adoption of sustainable systems, even in cases where such systems seem likely to prove economically and environmentally beneficial. Specifically, this can occur because producers who adopt rotations to reduce the need for fertilizer and chemical pest control may have to give up part of their base or allotment.

The Administration proposal recommends that the 1990 Farm Bill modify commodity program requirements to allow flexibility in crop bases and to protect the crop base of producers who plant legumes, grasses, or conserving crops on their base acreage.

- Producers who plant a part of their base acres to a soil-building crop would be able to receive deficiency payments for those acres, provided they did not harvest the crop.

- Producers would not receive deficiency payments for a conserving crop that was harvested.

- Producers would be allowed to plant any combination of program crops and oilseeds on their permitted acres and still be eligible to receive deficiency payments on the basis of the pre-1990 Farm Bill cropping history.

Conservation Compliance Recommendations

The conservation compliance provision provides that producers protect highly erodible cropland. Accordingly, the 1985 Food Security Act stipulates that any person producing an agricultural commodity on highly erodible land in any given year after January 1, 1990, must have in place and be actively implementing an approved conservation plan. However, because the Food Security Act of 1985 provides only for annual coverage on land used to produce agricultural commodities, implementation of an approved conservation plan is not required for acreage that is removed from production under an acreage reduction or paid reduction program.

- The 1990 Farm Bill should amend the conservation compliance provision of the Food Security Act of 1985 to explicitly include highly erodible lands that are idled under annual commodity programs.

Multi Year Set Aside Recommendations

Current program provisions require Acreage Conservation Reserve (ACR) land idled under annual programs to be protected from wind and water erosion, weeds and rodents in a manner approved by the County Agricultural Stabilization and Conservation Committee. The county committee determines whether a cover crop is required on ACR acres.

Part of the acreage devoted to ACR is now left unseeded and is mowed or tilled to control weeds. But, weeds are in some cases poorly controlled. In addition, perennial cover is seldom established on ACR acres. These management practices result in lost opportunities to naturally improve soil fertility, reduce weed problems on cropped land, improve water quality, improve habitat for wildlife, and have good quality forage available for drought emergencies.

The Administration recommends that:

- Producers be required to plant at least one-half of the ACR, not to exceed 5 percent of a crop acreage base, to an annual or perennial cover crop each year.

- If the farmer chooses to establish a perennial cover crop. The federal government will cost-share establishment expenses on a 50/50 basis. The producer would be permitted to receive cost-share assistance on no more than one-half of the ACR, not to exceed 5 percent of the crop acreage base, in any 5-year period. No cost-share assistance would be provided if the farmer chooses to plant an annual cover crop.

- Exceptions to the planting requirements be available for producers with rotations or similar practices for which planted cover is not consistent with sound farm management practices.

- Haying and grazing on all ACR acres be permitted under the same condition as currently permitted on ACR acres, except that mowing or grazing prior to July 1 would not be permitted on acres planted to perennial cover.

- Perennial cover be considered as planted to the program crop for deficiency payment purposes in the event of an acreage reduction program percentage of less than 5 percent of base.

- In any year in which the acreage reduction percentage is less than 5 percent of a crop acreage base, and less than the acreage for which cost-share assistance is made available, producers be permitted to exceed their normal crop acreage and plant the crop on cropland other than that for which cost-share assistance has been approved. This provision allows farmers to expand acreage in response to market signals while maintaining perennial cover on their ACR land.

Great Plains Conservation Program Recommendations

The Great Plains area is subject to severe and erratic climatic conditions. Severe droughts of long duration occur periodically. The soils that formed in the arid climate are generally highly erodible.

Low moisture conditions resulting from drought resulted in land damage from wind erosion that reached near record levels during the 1988-89 season. Current predictions are that these conditions are likely to continue in the foreseeable future and that significant additional damage will occur on unprotected land.

In 1956 Congress authorized the Great Plains Conservation Program to help farmers and ranchers prepare and implement a management program that will help prevent damage resulting from erratic climate. The program provides technical and financial assistance, under long-term contracts, to farmers and ranchers who develop acceptable plans for their entire farm or ranch. Assistance is available to mitigate climatic, soil, topographic, flood, saline and other natural hazards of the area.

The program has been very effective in solving problems in the region. For each acre under contract, soil erosion is reduced by 3.8 tons, and nearly 0.2 of an inch of soil moisture is conserved. Nearly 443 pounds per acre of additional forage is produced each year as a result of improved management. On cropland the accomplishments are greater: average erosion reduction is 11 tons per acre and 0.6 of an inch of soil moisture is conserved.

The program was extended in 1969 and again in 1981. The current authorization will expire on September 30, 1991. The total cost limit of the program (excluding administrative costs) is set at $50 million annually, not to exceed $600 million over the life of the program.

The Administration recommends that the 1990 Farm Bill authorize continuation of the Great Plains Conservation Program. The Administration specifically recommends that the 1990 Farm Bill:

- Amend the Soil Conservation and Domestic Allotment Act to change the termination date of the current authority from September 30, 1991, to September 30, 2001.

- Increase the limit on total program costs (excluding administrative costs) from $600 million to $900 million.

Thank you again, Mr. Chairman, for the opportunity to discuss our proposal for the conservation and environment title of the 1990 Farm Bill with your committee. We believe that these proposals will provide for a practical, economical, and environmentally sound conservation and environmental policy for agriculture in the years ahead. We also believe that this proposal is one that producers can and will accept.

Table 1. CRP Acres Contracted and Average Rental Rate

Signup	Signup dates	Acres bid	Acres contracted	Average rental rate
		Mil. acres		$/contract acre
1	3/3/86-3/14/86	4.82	0.75	42.00
2	5/5/86-5/16/86	4.71	2.77	44.05
3	8/4/86-8/15/86	6.44	4.70	46.96
4	2/9/87-2/27/87	11.24	9.48	53.38
5	7/20/87-7/31/87	5.86	4.44	48.03
6	2/1/88-2/19/88	4.51	3.38	47.90
7	7/18/88-8/31/88	3.43	2.61	49.71
8	2/6/89-2/24/89	3.22	2.46	51.04
9	7/17/89-8/4/89	4.22	3.33	50.99
	Cumulative:	48.45	33.92	48.93

Table 2. CRP Acres Contracted, by Year of Contract Expiration

Last year of contract	Acres contracted	Signups included
	Mil. acres	
1995	2.04	1, 2, 3
1996	13.67	2, 3, 4, 5
1997	8.76	4, 5, 6, 7
1998	5.35	6, 7, 8, 9
1999	4.10	8, 9

Table 3. CRP: Total Contracted Acres In Ten Leading States

State	Contracted acres	Share of total cropland 1/	Share of total CRP	Cumulative share
	Mil. acres		Percent	
Texas	3.92	11.0	11.6	11.6
North Dakota	3.14	11.1	9.3	20.9
Kansas	2.86	9.1	8.4	29.3
Montana	2.72	15.3	8.0	37.3
South Dakota	2.08	10.6	6.1	43.4
Iowa	1.97	7.2	5.8	49.2
Colorado	1.95	17.8	5.7	54.9
Minnesota	1.83	8.4	5.4	60.3
Missouri	1.50	7.7	4.4	64.7
Nebraska	1.35	5.8	4.0	68.7
Subtotal:	23.32	9.9		
U.S. Total:	33.92	7.7		

1/ Total cropland includes land idled under annual programs.

Table 4. CRP: Total Crop Acreage Base (CAB) Reduction, Leading States

Crop	CAB reduction	Share of total CAB 1/	Leading states-mil. acres
	Mil. acres	Percent	
Wheat	10.28	11.3	TX-1.27; KS-1.27; ND-1.12
Corn	3.78	4.4	IA-1.07; MN-.42; NE-.34
Sorghum	2.36	12.6	KS-.64; TX-.64; CO-.19
Barley	2.73	18.7	MT-.72; ND-.57; ID-.24
Oats	1.26	14.6	SD-.27; ND-.26; MN-.19
Up. Cotton	1.30	8.2	TX-1.11; OK-.06; MS-.03
	21.70	9.1	

1/ The total crop acreage base (CAB) for each crop includes base acres reduced by CRP.

Table 5. Average Program Yield on CRP Acres Versus U.S. Average Program Yield

Program crop	Avg. program yield on CRP acres	CRP program yield as a share of U.S. average
		Percent
Wheat	28 bushels	80
Corn	90 bushels	87
Sorghum	42 bushels	70
Barley	38 bushels	78
Oats	47 bushels	94
Up. cotton	321 pounds	54

Table 6. CRP Acres by Major Type of Conservation Practice and Percent of Total

Conservation practice	Million acres	Share of total Percent
Tame grass	19.82	--
Native grass	8.12	--
Already in grass	1.77	--
Total in grass	29.71	87.5
Trees	2.10	--
Already in trees	.08	--
Total in trees	2.18	6.4
Wildlife plantings	1.95	5.7

CRP Eligibility Criteria for Signups 1 - 9

Criteria	In Effect for Signups:
Cropland in Land Capability Class (LCC) II-V eroding above 3T	1 - 9
Cropland in LCC VI-VIII	1 - 9
Cropland in LCC II-V eroding above 2T and with serious gully erosion	3 - 9
Cropland with erodibility index (EI) of 8 or more, eroding greater than that recommended by Field Office Technical Guide (FOTG)	4 - 9 [1]
Cropland in LCC II-V eroding above 2T if planted to trees [2]	6 - 9
Filter strips 66 to 99 feet wide adjacent to water bodies	6 - 9
Cropland (flood plains) subject to scour erosion	8 - 9
Cropped wetlands	8 - 9

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[1] For the fourth signup, only cropland with EI of 8 or more, eroding greater than that recommended by FOTG was accepted in 1988 contracts.

[2] Only 33-1/3 percent of the area needs to meet the erosion rate criteria; as opposed to 66-2/3 percent otherwise.

Senator **Fowler**. I do not believe anybody—do you know something that I do not know—is anybody proposing requiring recordkeeping on pesticides?

Mr. **Gardner**. I do not know that anyone has proposed it formally, but I have read in the newspapers and elsewhere——

Senator **Fowler**. They might.

Mr. **Gardner** [continuing]. That such things have been contemplated.

Senator **Grassley**. Mr. Chairman, along that line——

Senator **Fowler**. Yes, Mr. Grassley.

Senator **Grassley**. There was a news conference held at the National Press Club——

Senator **Fowler**. Well, I know about news conferences. We do not accept that as sources around here.

Senator **Grassley**. Yes, but I just thought—that is probably where it has come from.

Senator **Fowler**. No, but——

Senator **Grassley**. Because it was, it is suggested in the proposals of this group of 11 organizations that came up with an environmental portion for the farm bill.

Senator **Fowler**. I understand that, Mr. Grassley.

Senator **Grassley**. OK.

Senator **Fowler**. We get a lot of suggestions in the press. I am interested in those that are before the committee, and I just wanted to know whether Dr. Gardner knew something I did not know.

Mr. **Gardner**. No, I am pleased to hear there are not any.

Senator **Fowler**. Mr. Secretary, let me ask you, in the Food Security Act of 1985, there was established a goal of 12.5 percent for tree plantings on all Conservation Reserve Program lands. And we are only half way there. Is this goal still a priority? Are we going to have another signup before this farm bill?

Mr. **Gardner**. The goal of forestation on some cropland is a goal. We would like to target some of the next 6 million acres for forestry.

Senator **Fowler**. Are you contemplating a signup? We still have millions of acres available for CRP signup. Why cannot we go ahead and have one now?

Mr. **Gardner**. Well, the idea is that we would like to postpone a signup until we are sure how Congress will come out in the 1990 bill, and what sort of targeting will emerge in the process as mutually acceptable to everybody. And we do not want to foreclose any possibilities with, say, an immediate signup now.

Senator **Fowler**. Well, I do not think we are going to foreclose any. I mean we are hoping—for instance, the Secretary has the discretion, as you know, right now to broaden the criteria.

Mr. **Gardner**. Yes. And we have broadened the criteria.

Senator **Fowler**. We have been urging shelterbelts, windbreaks, hardwood plantings, and in my State marginal pastureland. We have a lot of marginal pastureland sitting around idle. I wish you would take a look at why we cannot move——

Mr. **Gardner**. Well, it is true, Mr. Chairman——

Senator **Fowler** [continuing]. Since we are only half there under the act of 1985.

Mr. **Gardner**. Yes. Well, again, it is true that we can, and we have broadened the criteria for enrolling land. But still our proposals are somewhat different in focus. We are talking about a somewhat different approach for wetlands and for water quality purposes. And it seems that it would be better to wait and see how much of that emerges through your process. Then we can signup the acreage accordingly.

Senator **Fowler**. You indicate in your testimony that planting flexibility will encourage more environmentally sound agricultural practices. Can you be a little more specific as to how this will benefit conservation?

Mr. **Gardner**. Yes. I do not know that this would have a tremendous effect on rotations used, but there are some possibilities of rotations that farmers may undertake that involve legumes, perhaps, which are unharvested, and what we will do in our proposal is if these crops are not harvested, the producer can still get deficiency payments, maintain the base on NCA acreage while introducing such a rotation. Under current law, if that sort of rotation were introduced, the producer would lose some payments and lose some base. Now I do not know how many people will do such things, but I believe some will.

Senator **Fowler**. Senator Kerrey.

Senator **Kerrey**. Thank you, Mr. Chairman. I know there were others here ahead of me. I have to preside, and so I appreciate your permitting me to get a couple of questions in. First of all, I hope, Dr. Gardner, that you listen to the two Nebraskans who are going to testify here a little bit later. I have read both their statements, and I have talked to both individuals as well, and I think you will see in their testimony that both of them share the same objectives when it comes to soil conservation, but there is a dilemma, particularly with regard to the proposals of the administration to reduce target prices and allow the loan rates to drop under the Findley amendment.

In areas where land is highly erodible, you do tend to have more small-scale agriculture, and these are the individuals that are apt to face greater income squeezes as a consequence of the recommendations that the administration is making. I am curious as to whether or not you have looked in detail at some of the dilemma that is created by the alternative cropping system requirements of the SCS or the terracing requirements of SCS. Have you looked at the specific costs of these requirements versus the likely income in future years under the President's farm bill proposal and considered that the two taken together might, in fact, cause us to do precisely the opposite of what we are trying to do which is to keep the land in the hands of individuals who are trying to preserve soil?

Mr. **Gardner**. Well, Senator Kerrey, I do not know why you say our proposals are going to put a special squeeze on the smaller farmers, if that is what you were saying.

Senator **Kerrey**. That is what I am saying.

Mr. **Gardner**. But we——

Senator **Kerrey**. Well, Dr. Gardner, I know that you do not understand that. You and I have had this discussion before. It is painfully clear to me that you are not conscious of what the President's proposal will do for income for the smaller operator who tends, in fact, to be in that more highly erodible area. I am clear on that. But the question is whether or not you have actually sat down either with the SCS people who are working individual plans for these producers and looked at their forecast of income against the expense of alternative cropping systems or the expense of terracing? Have you actually sat down with a farmer, not from a distance with a macro set of economic projections of what the farm bill will do in terms of overall income, but an actual producer as he looks at the specific target prices and loan rates that are very likely? Although the administration has not given us target prices and loan rates, we have a pretty good idea of what they might be with a $10.2 billion budget request. We have a pretty good idea, and we have been talking to our people back home, and we are getting a pretty clear picture of what sort of squeezes might be occurring. I am simply curious as to whether or not you have actually sat down with a producer that faces that kind of a problem?

Mr. **Gardner**. Well, of course, we have met with many producers from many parts of the country in many different situations, and we have gotten information from them, too. But——

Senator **Kerrey**. No, no, no. Do not talk plural. Singular. Have you sat down with a farmer who is in a highly erodible land area and who is having to put in either an alternative cropping system or terracing that is relatively high in cost? Have you looked at what their income is apt to be under the President's proposal and heard them explain what it is they are going to have to do in order to be able to comply?

Mr. **Gardner**. What we have done is paid plenty of attention to individual producer situations. Now who in SCS has talked to a particular farmer about the cost of different conservation methods I do not know. But as far as linking that with our target price or the target prices that would come out of our budgetary limitations, I am quite sure we have not done that because we have not recommended a set of target prices.

Senator **Kerrey**. I wish you would. In fact, if you listen to the testimony that follows, you are going to hear from two farmers in northeastern Nebraska. Hear the conflict, the real conflict, that is out there. It is not an intellectual conflict. It is a real life and death conflict out there, and I hope you listen carefully to it because we are trying to make this thing work. We are trying to make the conservation section of the law work. And typically we end up with real life and death situations. The additional thing that I would say is that I want to make sure that you understand where there is disagreement. I think that the conservation section that is being developed is perhaps one of the most important sections of the bill.

I think it would be regrettable if we do not have an NCA that does, in fact, provide true flexibility. And I must again point out publicly that I do not think that the green book proposal that you have in place provides farmers with true flexibility. I thank you for your testimony.

Mr. **Gardner**. May I say, Senator Kerrey——

Senator **Kerrey**. No.

Senator **Fowler**. We thank you for your testimony. Do you have anything to say, Mr. Secretary?

Mr. Gardner. I would say that I think that the green book does provide true flexibility, and I am not sure in what sense you do not believe that it provides true flexibility, and again, I fully agree that we want the conservation provisions to work in the real world environment that people are in, and that is our objective, and we will be glad to work with you on that.

Senator Kerrey. Mr. Secretary, I only hope that you work with some specific producers out there because that is who we are dealing with. Thank you.

Senator Fowler. Senator Grassley, do you have any questions of the Secretary?

Senator Grassley. Just a comment on your exchange with the witness about that news conference, and when I see the Soil Conservation Society of America and Farmland Trust promoting a concept, I figure we have to deal with it eventually around here even if it is not introduced in legislation. And I hope maybe your comment indicates we might not have to deal with it, but I figured we did. And that was suggested in their report that they put out a couple weeks ago.

Senator Fowler. No, I am familiar with that because I was at the news conference.

Senator Grassley. OK.

Senator Fowler. But I do like to try to limit to what is on the table. We have some substantial proposals that do not include either mandatory recordkeeping on pesticides or pesticide tax or anything like that. I never know what anybody is going to introduce on the floor, but we have worked very hard in this committee to develop legislation that is amenable to the farmer, progressive, environmentally sound, and not based on press statements. Thank you.

Senator Gorton. Dr. Gardner, is your recommendation of a $40 million ceiling on CRP budget and fiscally driven, or does it stem from a belief that 40 million acres is all the country can either afford from an agricultural point of view to put into the CRP or all the acres that deserve it or are physically situated so that they ought to be in it?

Mr. Gardner. I would say it is a combination of those factors, and overall when you decide what is the right size for the CRP, it seems to me the kind of process you have to go through is asking as we add more and more acreage to the CRP what are the environmental benefits we get, compare that to what we are giving up in agricultural production, what it is going to cost the taxpayer, what the farmer is going to get in benefits from the rentals, what we are going to do to any surplus situation that is evolving? That is again how it fits into competitiveness and the markets. We have to weigh all those factors together and decide which is the right level to close off the entry of acreage into it, and what we thought is that 40 million acres is right.

Senator Gorton. Is it your view, then, that acreage above 40 million would begin sharply to decline in environmental value and would be more costly because of reduced production?

Mr. Gardner. I would not say it would have a sharp effect right at 40 million acres, but as you go beyond 40 million acres, the benefits are going to decline, and the costs are going to increase.

Senator GORTON. Thank you, Mr. Chairman.

Senator FOWLER. Thank you, Senator Gorton. The Senator from North Dakota.

Senator CONRAD. Thank you, Mr. Chairman. First, I want to welcome the Secretary, and I also want to start by commending Secretary Yeutter's attitude with respect to the conservation title insofar as he has agreed with the admonition that we need to do this on an incentive-based system. We are finding in my State and other States a backlash because of a heavy-handed bureaucratic approach in which we say to people you get farm program benefits; therefore, you farm it the way we tell you or you get the death penalty. You lose all of your farm program benefits. And in this day and age, that is the death penalty because you are out of farming.

So I want to first commend the Secretary for his attitude with respect to how you approach people. It is a very basic problem. How do you approach people? Some say, well, people are getting farm program benefits; therefore, we are in a position to dictate to them. If people just think about that basic statement and the attitude that it indicates, I think they will realize it is counterproductive. Dictating to people never works very well. And these are the very people that we need to carry out the important mission that we have identified as a national priority, that of preserving wetlands, preserving highly erodible soils, and it is not going to work if we alienate the very people that have to do the job. So I want to start with that.

I also want to commend very highly the chairman of this subcommittee because he has shown great courage frankly in coming forward with a conservation title in the bill, as I understand it will be introduced today.

Senator FOWLER. Today or tomorrow.

Senator CONRAD. Today or tomorrow. That is, I think, a very major step forward, and I think we ought to take note of that at this hearing.

Two things that I would like to get at. One is the conservation reserve, the 40 million acres, the cost of the program, and I just want to note that an economic assessment of CRP by the Economic Research Service at USDA, reached the cheerful conclusion that CRP will result in net national benefits of $3.4 to $11 billion, counting environmental benefits.

I simply have to say for the record, Mr. Chairman, Mr. Secretary, and say it quite bluntly, that I have very serious reservations about the technical quality of this cost-benefit analysis. While the ERS appears to have done a thorough job of estimating the benefits, the same, unfortunately, cannot be said for the effort given to estimating the costs. Just one example: the authors state that unemployment or underemployment of production and marketing resources caused by reduced crop production should be included among the costs. In the next paragraph they reveal they failed to do so.

Now I do not know, since that is the major cost, I do not know how we can have any kind of serious study that includes all the benefits but leaves out the major part of the cost. And when we are making decisions, I think it is fundamentally important that we have information before us that gives a fair and objective reading so that we can reach a rational conclusion. I would just point out, and I would like to enter for the record my prepared statement, Mr. Chairman, so I do not take the time of the subcommittee.

Senator **Fowler**. Without objection.

Senator **Conrad**. I would also like to enter into the record the ERS study entitled "Agriculture's Links to the National Economy," and then a study from the State University of North Dakota, "Economic Impact of the Conservation Reserve Program in North Dakota" which does provide an analysis of the full costs. And what it concludes in just North Dakota with only the first five signups, they concluded the State's economy has been reduced by $141 million every year with a long-term loss of 2,400 jobs—just in the State of North Dakota. On a national scale losses of economic activity total some $40 billion a year, millions of jobs. I think we have to factor this in when we consider precisely what it is we are doing and the effects of it.

I would just go to the question that I asked Mr. Brown. In my State, acreage is coming out that is not just highly erodible, but very good farmland. In fact, some of the finest farmland is coming out because it is being bid out, because we are paying double the current level of cash rent. Mr. Chairman and Mr. Secretary, I think we have to address this fundamental underlying question. Does this make sense? Does it make sense from an economic standpoint? Does it make sense from an environmental standpoint when we are taking out land that is not just highly erodible? We are taking out land that is some of the best, most productive in my State because there is a much greater return by putting it into CRP than by farming that land.

And the economic impact on the small towns is profound. You can go into small towns and counties that have 25 percent of their land taken out of production—they are in the CRP—and the small towns that service that area are devastated. We have to think very, very carefully about what we are doing and evaluate the economic as well as the environmental effects.

With that, Mr. Chairman, I would have a statement I would like to enter into the record as well as the two studies and an article, "CRP Affects North Dakota" that I mentioned and thank the chairman very much for his patience in this regard.

Senator **Fowler**. Without objection.

[The prepared statement of Senator Conrad, the two above-mentioned studies, charts, and an article entitled, "CRP Affects North Dakota" follow:]

PREPARED STATEMENT OF HON. KENT CONRAD, A U.S. SENATOR FROM NORTH DAKOTA

Mr. Chairman, I appreciate your allowing me the time to say a few words. I know you have a very full hearing scheduled this afternoon.

I would like to take issue with an economic assessment of the Conservation Reserve Program issued recently by USDA's Economic Research Service. This assessment reached the cheerful conclusion that the CRP will result in net national benefits of $3.4 to $11.0 billion, counting environmental benefits.

I have to say quite bluntly that I have serious reservations about the technical quality of this cost-benefit analysis. While the ERS appears to have done a thorough job of estimating the benefits that would accrue from the CRP, the same cannot be said for the effort given to estimating the costs. Let me cite just one example: the authors state that unemployment or underemployment of production and marketing resources caused by reduced crop production should be included among the costs. In the very next paragraph, they acknowledge that their analysis did not include these costs.

Mr. Chairman, I am sure that measuring all of the effects of a complicated program like the CRP is a difficult task. But it does not serve the debate to throw around numbers such as $3.4 to $11.0 billion in benefits when all of the costs have not been included. The numbers get everyone's attention but no one ever reports the fine print.

With your permission, Mr. Chairman, I would like to include in the record a few numbers myself. Researchers at North Dakota State University (NDSU) analyzed the economic impacts of the CRP on North Dakota. Using data from only the first five signups, they concluded that the State's economy has been reduced by $141 million every year. Over the period of a few years, about 2,400 jobs will be lost to the North Dakota economy.

Unlike the ERS study, this analysis included the impact of the CRP on agricultural input retailers. These retailers have suffered the most—they have absorbed 40 percent of the $141 million in reduced State income. Mr. Chairman, I ask that the NDSU study be included in the record.

I also ask that another ERS study entitled "Agriculture's Links to the National Economy" be included in the record. This study makes a clear case that large, permanent acreage reductions affect the entire economy by forcing cutbacks in industries linked to agricultural production. Farming itself accounts for only 2 percent of our Nation's gross national product. But the entire agribusiness complex accounts for 18 percent of GNP and 21.3 million jobs.

Mr. Chairman, I do not want to leave the impression that I am opposed to the Conservation Reserve Program. It has been a useful vehicle for conserving soil. I *am* opposed, however, to glossing over the real economic hardship that the CRP has caused in predominantly agricultural States such as North Dakota. That economic hardship—those 2,400 lost jobs—is a direct result of the CRP and any responsible assessment of the CRP should include that information.

Mr. Chairman, thank you again for allowing me to voice my concerns today.

[Material submitted by Senator Conrad follows:]

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Agriculture's Links to the National Economy

Income and Employment

David Harrington
Gerald Schluter
Patrick O'Brien

The economic and employment links between agriculture and the industries supplying its inputs and marketing its output determine how a change in the agricultural sector will affect the rest of the economy. These links can work differently for large economic shocks or policy changes than for small ones. For example, minor changes in farm programs (such as temporarily reducing commodity acreage or production to limit Government stock accumulation) have little effect on employment and income in the rest of the economy. But substantial changes in farm programs (such as large, permanent acreage reductions to significantly raise farm commodity prices) affect the entire economy by forcing cutbacks in industries linked to agricultural production.

Natural disasters, changes in domestic or export demand, world crop shortages, and changes in Government commodity or environmental policies are among the events that can shock the agricultural economy. These shocks can change agricultural production and its demand for production inputs. A small shock may be felt just in the agricultural sector. But, a much larger shock, involving the economic and employment patterns linking the agricultural sector with the entire economy, may be felt throughout the Nation's economy. Analysis of the economic and employment linkages helps us understand and measure the extent to which they transmit shocks throughout the economy.

The Food Security Act of 1985 broadened the responsibility of the U.S. Department of Agriculture (USDA) for analyzing how farm programs affect both the farm economy and the input and processing industries linked to it, and how changes in farm programs affect trade, consumers, the general economy, and tax revenues. The first step in this process is to understand what can and cannot be concluded about agriculture's role in generating employment and income in the Nation's economy.

Our objectives are to explain the input and output relationships of the agricultural sector for 1984 and to show how changes in the farm sector can alter the Nation's economy. We use two alternatives—a small annual acreage reduction program and a large permanent acreage reduction program—to illustrate how the effects of changes in Government commodity programs can differ greatly depending on the size of the changes and how much of the Nation's economy is affected. Relatively small changes in farm programs can leave the rest of the national economy largely untouched. But large program changes, especially if they are permanent, can pervasively influence employment and income throughout the economy.

We base our analysis on an ongoing Economic Research Service program analyzing the effects of economic and policy changes on the farm sector and related industries.

LIMITATIONS

This study focuses on linkages based on input/output relationships in the national accounts maintained by the U.S. Department of Commerce which portray the structure of the economy for 1977. These relationships are stable over time even though the level of economic activity in various industries varies yearly. We have updated these relationships to the actual output levels for 1984 for this analysis.

The estimated relationships are subject to several limitations. First, the analyses of the effects of farm programs compare situations only "with" versus "without" an economic shock or change in agricultural programs. Moreover, these comparisons show only effects after the farm sector and the economy have had several years to adjust to a sustained change in programs.

Second, some necessary assumptions of the methods of analysis may introduce errors. However, these errors tend to balance each other, and the resulting estimates are as correct as possible given current knowledge and analytic techniques. Three assumptions tend to overstate the adjustments the economy would make:

- o The analysis assumes no "redeployment" of factors (labor, land, inputs). Each industry or sector will continue to use exactly the same methods of production and proportions of inputs in producing its output as it did before the change or economic shock. In reality, each sector can alter the mix of inputs it uses to create its products in response to a change or shock.

- o The analysis assumes no "reemployment" of factors released by a change in the level of economic activity. For example, labor displaced from a sector is assumed not to be reemployed in another sector. Changing the use of factors from one sector to another is another way that the economy adjusts to a change or shock.

- o The analysis assumes that prices of all goods and services in the economy remain constant relative to each other. Changing the relative prices of goods is a third way that the economy accommodates a change or shock.

However, these assumptions are balanced by considering only direct changes in input, farming, and downstream processing activities. For example, we ignore effects of the changes in automobile sales caused by employment changes in agriculturally related industries. These indirect linkages are strong throughout the economy and tend to balance the errors inherent in the previous assumptions. Nevertheless, the input/output method of analysis, while relatively accurate over 2 to 4 years, progressively loses accuracy for longer periods, especially for very large program changes. This is because more factors can be redeployed or reemployed, and relative prices of goods and services can change over time in response to a large shock or policy change.

AGRICULTURAL LINKAGES

Farming is linked to the rest of the food and fiber system, and ultimately to the entire economy, through a network of input purchases and product sales. Farmers buy inputs such as equipment, supplies, feed, seed, fertilizer, labor, and financing from "upstream" industries. And they sell products to "downstream" sectors that store, process, transport, manufacture, distribute, retail, consume, or export the products. Some downstream linkages can involve many steps. For example, cotton may be ginned, spun into thread, woven into fabric, manufactured into garments, and sold in retail stores. Other downstream linkages can be short, as with grain destined for storage or export, which may only be transported to a central terminal or port.

Agriculture is only one link in this interrelated network of industries. It neither drives nor pulls the whole economic system. The agricultural sector can purchase inputs and sell its own products only because there is demand for the final products that will be produced from them. The farm sector cannot unilaterally increase its output and expect to proportionally increase activity in the rest of the economy. This could happen only if agriculture were the only factor limiting the output of the economy. This has seldom been true; agricultural production usually exceeds demand, both domestic and foreign. Since the excess is stored by farmers or by Government, farm production can frequently be cut, within limits, without proportionally reducing activity in the rest of the economy. In addition, the entire economic system is driven by the volume of output of each industry, not the value of output. Changing prices of outputs cannot directly affect the volume of output or employment in the economy. Thus, simply raising agricultural commodity prices cannot, by itself, increase income or employment in the economy.

Ties between farming and its linked industries and, ultimately, the general economy have strengthened over the last two decades. For example, inputs purchased to produce farm products increased from $51 billion in the early 1960's to $81 billion (inflation factored out) in the early 1980's. Also, far more value is now added to agricultural products beyond the farm. Activity in downstream industries rose from $235 billion in the early 1960's to $440 billion (inflation removed) in the early 1980's.

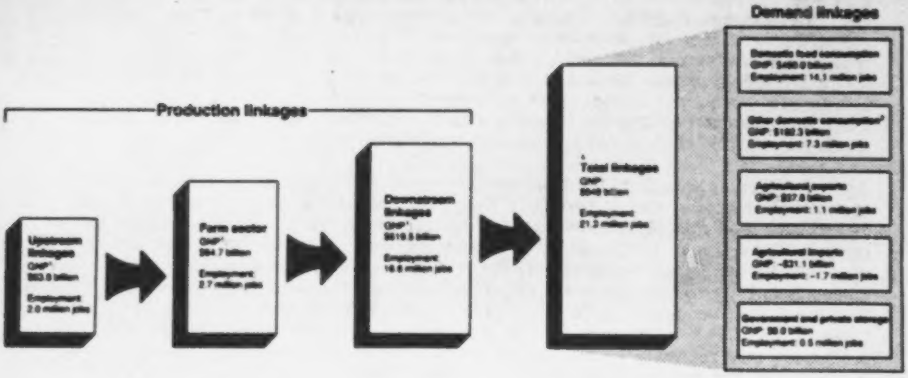
CURRENT LINKAGES

Figure 1 illustrates the links between the food and fiber system and the whole economy. The $648 billion in final consumer, export, and stock demand for farm products reported in 1984 was linked to $520 billion in downstream activities, $65 billion in onfarm activities, and $64 billion in upstream activities. Another view shows that $1 of farm business activity was actually comprised of 64 cents in upstream input activity and 36 cents in onfarm activity, to which $3.20 was added in downstream activity if the product was ultimately consumed domestically. However, this same $1.00 in farm and upstream activity was linked to only 31 cents in downstream activity if the product in question was exported as raw product, or a negligible amount if it was stored by the farmer or Government as surplus.

The entire agribusiness complex accounts for 18 percent of the U.S. gross national product (GNP). Farming accounts for 2 percent of total GNP, upstream activities account for another 2 percent, and downstream activities account for 14 percent. Of the 21.3 million jobs involved in meeting consumer and export demand and storing surplus farm products in 1984, 16.6 million jobs were in downstream activities, 2.7 million jobs were in onfarm activities, and 2.0 million were in upstream activities.

Figure 1

Agricultural sector GNP and employment linkages, 1984



[1] Scaled to level of demand to correct for small errors introduced in calculation.
[2] Clothing, shoes, tobacco, cut flowers, seeds and potted plants.

FARM PROGRAM EFFECTS

We use two farm program alternatives to illustrate how closely changes in employment and economic activity are linked with changes in farm programs.

o Alternative 1 is a small annual acreage reduction program designed to limit accumulation of excess Government stocks and leave longrun farm prices essentially unaltered.

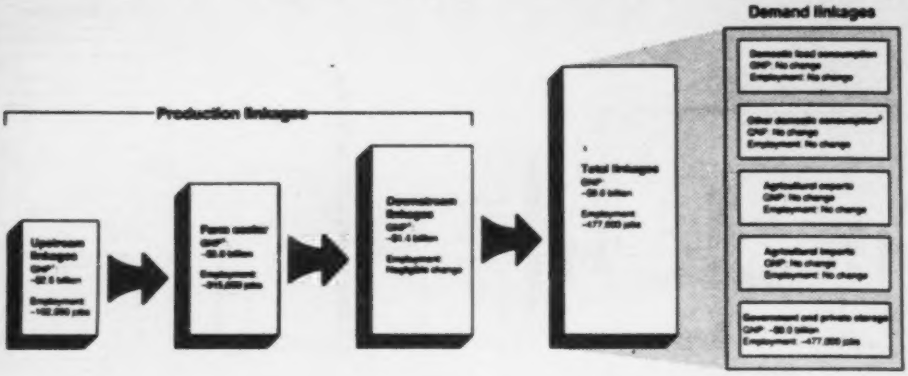
o Alternative 2 is a large permanent acreage reduction program designed to significantly raise farm commodity prices.

Figure 2 shows the linkage effects of the first alternative, a typical voluntary acreage reduction program. Acreage in the commodity programs declines 30 million acres, roughly 10–15 percent of the total program acreage. Such a reduction is roughly equal to the average of the programs in effect since the midsixties. Most acreage reduction comes from wheat and feed grains, with smaller reductions for cotton and rice. Because this reduction only minimizes excess production that would otherwise end up as surplus Government stocks, the effect on final demand for farm products is limited to changes in stock demand.

With no changes in consumer or export demand, economywide effects of this relatively small acreage reduction program are small, falling mostly on farming and input industries. A 30–million–acre reduction reduces final stocks $9 billion, onfarm activity $5 billion, input industry activity $3 billion, and downstream activities $1 billion (fig. 2). The program's effects on employment are also largely limited to those same industries: 315,000 jobs lost in farming, 162,000 jobs lost in upstream input industries, and very few jobs lost in downstream industries.

Figure 2

Alternative 1:
How a small acreage reduction program would change agricultural sector GNP and employment



¹Scaled to change in demand to correct for small errors introduced in calculation.
²Clothing, shoes, tobacco, cut flowers, seeds and potted plants.

These estimates of GNP and employment effects must be qualified, in addition to the limitations noted in the box. First, although the estimates are measured relative to a base situation that assumes full use of our agricultural production capacity, the farm sector has not operated at full capacity for 7 of the past 10 years. Hence, part of the losses noted are hypothetical because the economy has already absorbed them in arriving at the current level of income and employment. Second, a large part of the employment change in the farm sector is more likely to be felt as underemployment of farm operators and their families than as loss of jobs.

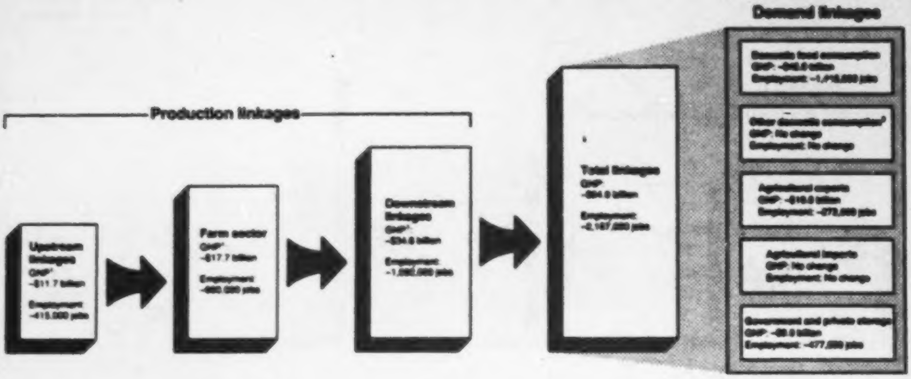
The effect of alternative 2, a large acreage reduction program aimed at balancing supply and use at much higher commodity prices, is substantially larger than the effect of alternative 1 (fig. 3). A 125-million-acre reduction designed to raise commodity prices to 80 percent of parity would idle roughly 50 percent of the program acreage base and raise farm prices 30 to 40 percent above 1985/86 levels. (Parity is a measure of the purchasing power of agricultural products from a 1910 to 1914 base period.)

A 30- to 40-percent rise in farm prices discourages domestic use and cuts exports sharply. Domestic food demand could fall at least 10 percent, export demand for farm commodities could fall 40 percent, and stock demand could be essentially eliminated (fig. 3). The drastically reduced volume moving through the system reduces downstream activity by $35 billion, onfarm activity by $18 billion, and upstream activity by $12 billion. Corresponding employment losses are 1.1 million jobs downstream, 660,000 jobs on farms, and 415,000 jobs upstream.

A 125-million-acre reduction involves the full range of agribusiness linkages, so its effects are much larger than those of a 30-million-acre reduction. The smaller reduction involves only the input, farm, and storage sectors, which account for relatively little of the economy's total labor force and economic activity.

Figure 3

Alternative 2:
How a large acreage reduction program would change agricultural sector GNP and employment



[1] Scaled to change in demand to correct for small errors introduced in calculation.
[2] Clothing, shoes, tobacco, cut flowers, seeds and potted plants.

CONCLUSIONS

Farm sector linkages to the agricultural complex and the general economy provide the analytical basis for assessing effects of farm commodity programs on the affected industries and the general economy. These linkage measures support two conclusions:

o Temporary farm programs using small acreage reductions or supply restrictions to limit Government accumulation of excess stocks have little effect on employment and income in the rest of the economy.

o Permanent farm programs involving large acreage reductions or supply restrictions to significantly raise farm commodity prices affect the entire economy by reducing farm production, increasing farm prices, and forcing cutbacks in industries linked to agricultural production.

Domestic income and employment linkages allow us to measure how effects of economic shocks or policy changes are transmitted from the farm sector to the agricultural complex and then to the general economy. Although income and employment linkages are only one set of measures, they help us evaluate how agricultural policies affect the rest of the economy. More complete analyses must include short- and long-term effects on domestic and export demand, competitor responses, economic efficiency, program effectiveness, and other factors.

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ECONOMIC IMPACT OF THE CONSERVATION RESERVE PROGRAM IN NORTH DAKOTA

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Abstract:

Short-run economic impacts of the Conservation Reserve Program (CRP) in North Dakota are estimated using an input-output model together with results from a statewide survey of CRP participants. Total business activity was reduced 0.5 percent at the state level and 0.9 percent for the most affected region, and employment was reduced by about 2,400 jobs statewide.

Key Words: Socioeconomic impact analysis
Conservation Reserve Program
North Dakota

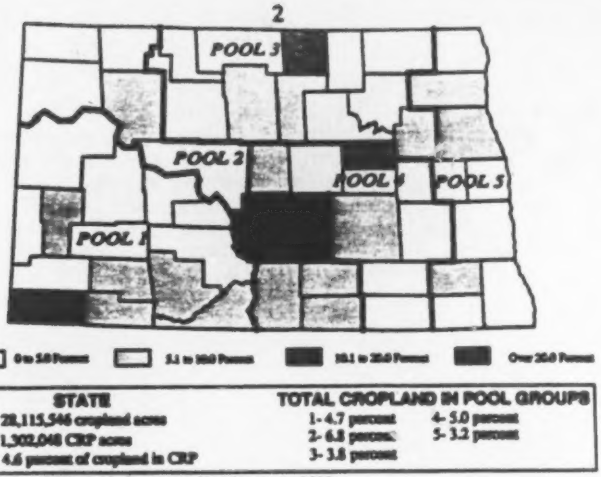
ECONOMIC IMPACT OF THE CONSERVATION RESERVE PROGRAM IN NORTH DAKOTA

Long-term retirement of cropland has been utilized in the United States as a policy tool to achieve both agricultural supply control and conservation objectives. The first major federal program for long-term land retirement was the Conservation Reserve Program (better known as the Soil Bank) that was initiated in the mid-1950s. Enrollment in the Soil Bank peaked in 1960 at nearly 29 million acres nationwide, and the last contracts expired in 1970. More recently, long-term cropland retirement has been implemented as part of the 1985 Food Security Act (Public Law 99-198). The main objective of the current Conservation Reserve Program (CRP) is to take highly erodible land out of production, thereby reducing wind and water erosion, protecting long-term food-producing capability, reducing sedimentation, improving water quality, creating wildlife habitat, curbing excess production, and providing income support for farmers. Nationally, this program had reached about one-half its goal (22,150,025 acres) through the fifth sign-up period (July 1987). North Dakota ranked seventh among the states, with 1.3 million contracted acres or about 4.8 percent of the state's total cropland (U.S. Bureau of Census 1982 and Dicks et al. 1988).

Examination of the new program's features and review of the effects of the Soil Bank program have stimulated interest concerning possible socioeconomic impacts of the CRP in areas with high concentrations of eligible land. Potential impacts include those arising from (1) reducing the use of agricultural inputs such as fuel, fertilizer, and chemicals; (2) reducing the use of farm labor and machinery; and (3) long-term changes in land use if CRP land is not returned to crop production at the end of the contract period. Also, the review of literature dealing with the effects of the Soil Bank program suggests that enrollment in the CRP could be associated with increased off-farm work by farm operators and could speed farm consolidation and rural-to-urban migration (Kaldor; McArthur; Christensen and Micka; Paulson et al.; Barr et al.; Schmid; Taylor et al.; and Butler and Lanham). This study was undertaken to determine key characteristics of CRP participants in North Dakota and to estimate the short-run economic impacts of the CRP in the state.

PROCEDURES

The study had two major phases. First, a statewide survey of CRP participants was conducted to determine selected characteristics of those individuals and their enrolled land that would be important for subsequent impact estimation. These characteristics included land attributes (such as comparison of costs and returns and soil productivity to those of non-CRP land in the area, comparison of CRP payments to local cash rents, cover option chosen, and cost of cover establishment) and landowner characteristics (such as age, residency, level of farm income, and use of CRP payments). A questionnaire was mailed to nearly 3,000 randomly selected landowners in North Dakota (approximately 40 percent of all participants) in early March 1988. Follow-up mailings resulted in 1,289 useable surveys for a response rate of 44 percent. Response rates were quite similar for each of the state's five pool groups (see Figure 1).



SOURCE: USDA Soil Conservation Service, 1988.

FIGURE 1. PERCENTAGE OF TOTAL CROPLAND ENROLLED IN CRP BY CATEGORY, JULY 1987

Key survey results were tabulated, then a regional input-output model, previously developed from primary data and consisting of 17 sectors, was used to estimate the indirect effects of the CRP program for each of the state's five pool groups. (For a detailed description of the model, see Coon et al.) An important prerequisite to estimating these indirect effects was estimating the direct effects of program participation on farm expenditures and income. Sectors expected to experience direct effects were (1) the retail trade sector; (2) finance, insurance, and real estate; (3) business and personal services; and (4) the household sector. The procedures used to estimate these changes in expenditures are summarized in Figure 2. Three main sources of data were used to estimate expenditure changes: (1) county CRP survey data (Mortensen et al. 1988), (2) North Dakota agricultural statistics (NASS 1988), and (3) county data from the state Agricultural Stabilization and Conservation Service (ASCS)[2]. Initially compiled on a county-by-county basis, the resulting estimates fall into three main categories: (1) reduced input expenditures, (2) reduced federal commodity payments, and (3) increased CRP contract payments and upkeep costs. (For a more detailed discussion of data sources and estimation procedures, see Mortensen et al. 1989.)

After the change in business activity resulting from the CRP program had been estimated for each sector, the resulting change in employment was estimated based on historic relationships between employment and gross business volume in each sector.

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[2] Impacts of the CRP were analyzed using 1987 data on farm prices and costs and CRP acres through the fifth sign-up due to availability of data and the abnormal nature of the 1988 drought. It should be recognized, however, that not all acres that were enrolled through July 1987 were taken out of production that year.

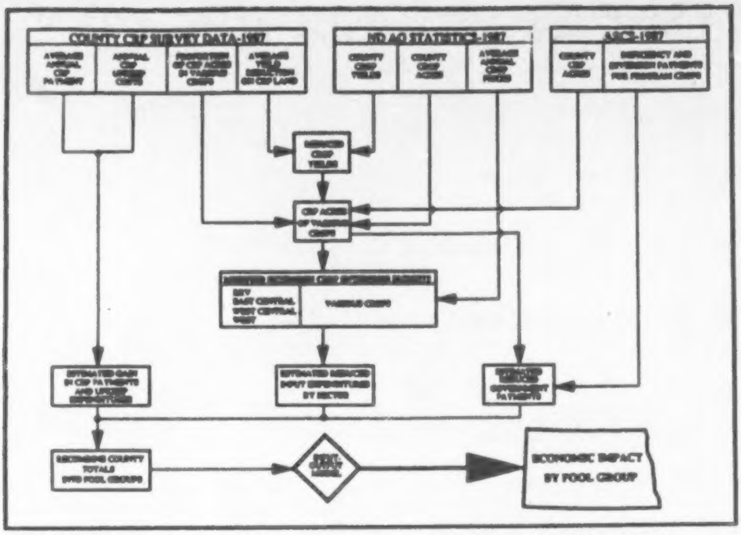

FIGURE 2. METHOD OF ANALYSIS USED IN ESTIMATING CRP IMPACTS

SURVEY RESULTS

CRP participants generally felt their CRP land was less productive than other land in the area and that input costs were slightly higher (Table 1). (Unless otherwise noted, the values shown are the mean for all survey respondents.) CRP contract payments were felt to be 6.7 percent higher, on average, than prevailing cash rental rates in the area. The initial cost of establishing CRP cover averaged $37.20 per acre with more than 42.4 percent of responses falling between $30 and $40.

The average age of CRP landowners was 57 years, and nearly 62 percent were over age 55 (Table 1). About 73 percent of the respondents had farmed either part-time or full-time in 1987, and there was no significant age difference between farmers and nonfarmers. In contrast, a 1988 longitudinal survey of a statewide farm panel indicated an average age of 47.2 years (Leistritz et al.). The finding that older farmers are more likely to participate in land retirement programs is consistent with those of several studies of Soil Bank participants (Schmid; Barr et al.; Christensen and Micka,; and Kaldor), although some studies of Soil Bank enrollees found no significant differences in ages (Butler and Lanham; McArthur).

The average 1987 gross farm income of the farmer participants was just over $94,000 or about 20 percent less than that reported for that year by a statewide longitudinal farm panel (Leistritz et al.). This is similar to the findings of Christensen and Micka, who reported that Soil Bank participants in Maine had smaller than average farms. On the other hand, Butler and Lanham reported that Soil Bank participants in South Carolina had larger farms than nonparticipants. The average net cash farm income of $16,259 was about 22 percent less than that

TABLE 1. SELECTED CHARACTERISTICS OF CRP LAND AND PARTICIPANTS, NORTH DAKOTA, 1988

Item	Units	Value
Yields–CRP land compared to land not in CRP	Percent	-9.5
Input costs–CRP land compared to land not in CRP	Percent	0.5
CRP contract payment compared to cash rent	Percent	6.7
Costs per acre to establish CRP cover	Dollars	37.20
Costs per acre to maintain CRP cover	Dollars	6.92
Annual CRP contract payment	Dollars	36.98
Type of CRP cover:		
Grass and/or legumes	Percent	91.0
Trees (on part of area)	Percent	9.0
Landowner Age	Years	57.2
Landowner resides in:		
North Dakota	Percent	90.0
Landowner occupation:		
Farmer	Percent	73.0
Other	Percent	27.0
Gross farm income, 1987 (farmers only):		
Average	Dollars	92,440
Net Cash Farm Income, 1987 (farmers only):		
Average	Dollars	16,259
CRP payment as a percent of net farm income over 100 percent or net farm income was negative	Percent	40.6
Did the CRP program enable you to continue farming?		
Yes	Percent	20.6

for the farm panel. For 41 percent of these producers, their CRP income exceeded their net cash farm income, and about 21 percent said that the program enabled them to continue farming. (For a more detailed description of CRP participants' attributes, see Mortensen et al. 1988.)

Ninety percent of the survey respondents lived in North Dakota. About 4 percent lived in the neighboring states of Montana, South Dakota, or Minnesota, and the balance lived in 22 other states. Although anecdotal information from areas with high rates of CRP enrollment had indicated that many participants used their payments as a means to vacation or retire out-of-state, only 3.5 percent of survey respondents indicated they had near-term plans to retire outside the state, and only 3.5 percent indicated out-of-state leisure activities as an intended use of their CRP income.

The CRP participants were also queried about their opinions regarding certain aspects of the program. Over 92 percent agreed that CRP provides wildlife habitat. In addition, nearly 90 percent felt that CRP offers protection for fragile land. About 80 percent agreed that eligibility for CRP entry should be based on soil characteristics rather than management and tillage practices. Over 77 percent of the landowners agreed that CRP benefits them financially. A majority (71.1 percent) also agreed that CRP reduces the sales of local agribusiness suppliers. Nearly 39 percent agreed and over 33 percent disagreed with the statement that land eligibility requirements should be eased. Nearly an equal percentage agreed and disagreed (37.4 percent and 38.4 percent, respectively) with the statement that counties should have the option of going beyond the 25 percent of total county cropland limit for enrolling CRP acreage. About 37 percent agreed with the statement that CRP rewards poor farming practices, and about 42 percent disagreed. Reaction was also mixed to the question of raising the 45 million acre national CRP limit with about 39 percent indicating a neutral response. Nearly 41 percent disagreed and only about 27 percent agreed with the notion that CPR is costing the federal government too much money.

Economic Impact Assessment

Reduced direct expenditures caused by taking CRP land out of production total $55 million for the state with nearly 62 percent of this effect occurring in the retail sector (Table 2). Pool groups two, four, and five have the highest net impact at about $12 million each. However, the household sector is positively affected in pool groups one, two, and three primarily because the CRP rental payments exceeded the farm income and government program payments that were foregone.

The direct effects were applied to the input-output model to estimate the total impact of the CRP program. The $55 million in direct effects resulting from the CRP result in about $141 million in reduced business activity for the state--an overall multiplier of 1.56 (Table 2). This total is spread among 13 sectors of the state's economy with the retail sector absorbing the greatest impact--about 40 percent of the state total. (For a detailed discussion of sectoral impacts, see Mortensen et al. 1989.)

Among the county groupings, pool group five has the largest absolute impact from the CRP, reflecting the more intensive nature of agriculture in eastern North Dakota (Table 2). Pool group four, on the other hand, has the greatest

TABLE 2. DISTRIBUTION OF CRP ACRES, CRP-RELATED CHANGE IN DIRECT EXPENDITURES, TOTAL CRP IMPACT, CRP IMPACT AS A PERCENT OF BASELINE, AND CRP-RELATED EMPLOYMENT CHANGE

Pool Group	CRP Acres	CRP-Related Change in Direct Expenditures and Household Income	Total CRP Impact	CRP Impact as a Percentage of Pool Baseline	CRP-Related Employment Change
	(%)	(million $)	(million $)	(%)	(number)
1	18.8	-8,336	-21.2	-0.33	-371
2	29.3	-12,229	-30.0	-0.68	-552
3	20.0	-10,175	-25.5	-0.52	-453
4	18.5	-12,569	-31.6	-0.91	-523
5	13.4	-12,594	-32.2	-0.39	-517
TOTAL	100.0	-55,903	-140.5	-0.54	-2,416

percentage impact. In no case, however, does the CRP impact exceed 1 percent of the area's baseline business volume. Employment effects of CRP are distributed somewhat differently than effects on business volume; pool group two has the largest total impact. Although the total CRP-related potential employment reduction is estimated to be only 2,416 jobs statewide, or about 0.77 percent of average annual employment in 1987, it should be noted that much of this employment loss may be concentrated in the state's most agriculturally dependent rural areas—areas already hard-hit by reductions in retail trade volume and employment stemming from the depressed state of the agricultural economy.

CONCLUSIONS AND IMPLICATIONS

The results of this analysis of the impact of the Conservation Reserve Program on the North Dakota economy indicate that impacts of the program to date have been modest at the state and substate regional levels; total business activity was the state and 0.91 percent for the most substantially affected region. However, it should be noted that the impacts are not distributed uniformly among sectors or communities. Rather, the retail sector accounted for more than 40 percent of the total impact of the program. Further, within the retail sector, businesses that rely on farm supplies or machinery for much of their volume are likely to be affected much more than others. Similarly, because the CRP enrollment varies substantially among counties, those with higher percentages of their cropland enrolled will obviously experience greater impacts. In North Dakota, five counties had more than 10 percent of their land enrolled through the fifth sign-up (July 1987), and in one county about 22 percent was enrolled. Finally, because substantial acreages have been enrolled in the program in subsequent sign-ups (statewide about 800,000 more acres were added in the sixth and seventh enrollments), the effects of the fully implemented CRP program will be greater than those shown here.

In addition to the negative effects resulting from initial reductions in agricultural activities, the program has a number of positive aspects. A short-run impact has been to sharply increase the demand for grass seed used in establishing vegetative cover. Other, longer-run effects could stem from achieving the program's conservation objectives, particularly if much of the land remains in noncrop uses after the contracts expire. Estimating possible economic consequences of such effects as reduced soil erosion, increased water quality, and enhanced wildlife habitat was beyond the scope of this study. Such impacts should be addressed in future analyses, however, and input-output analysis would be a very appropriate tool for quantifying some of these effects.

8

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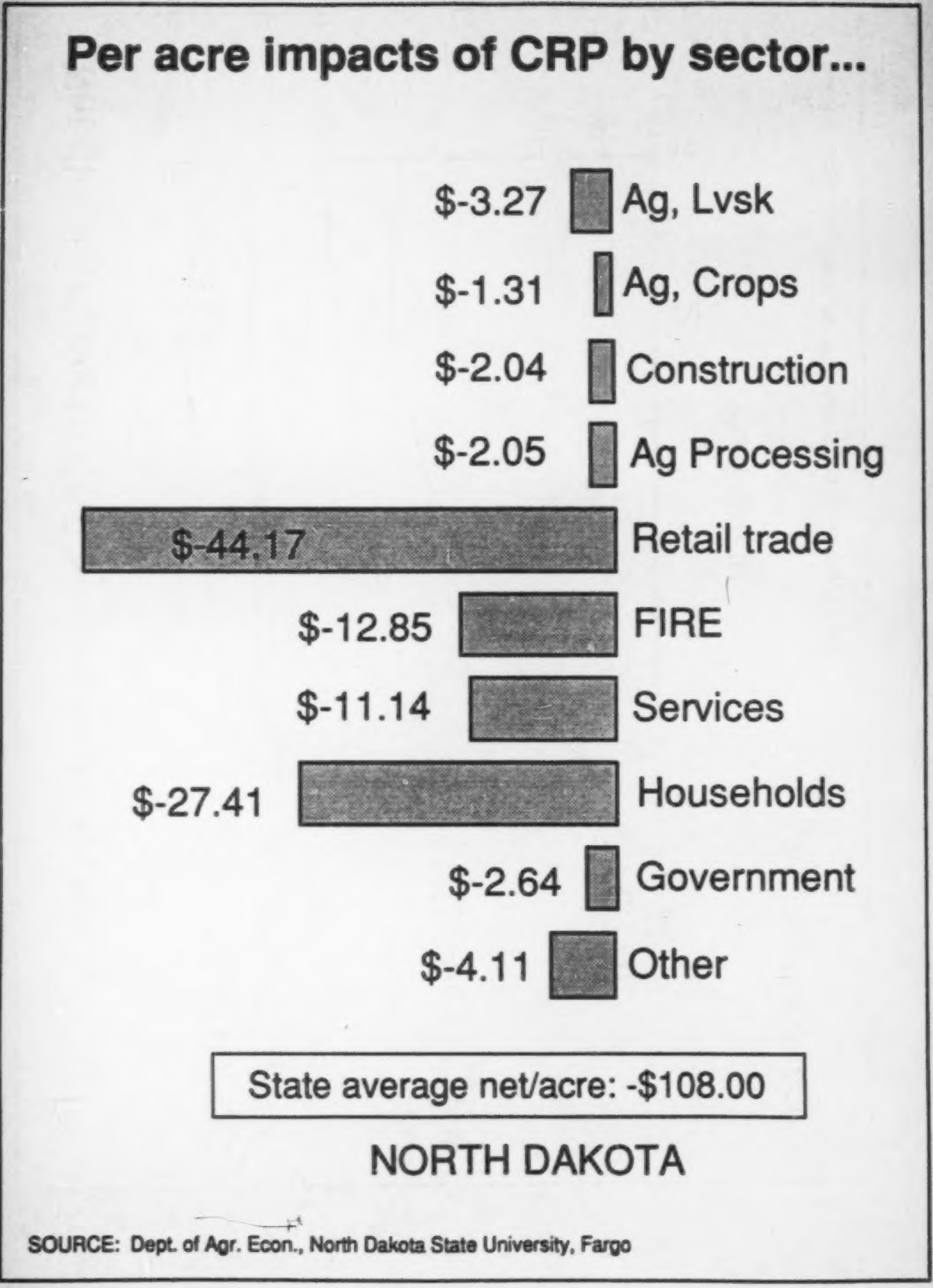


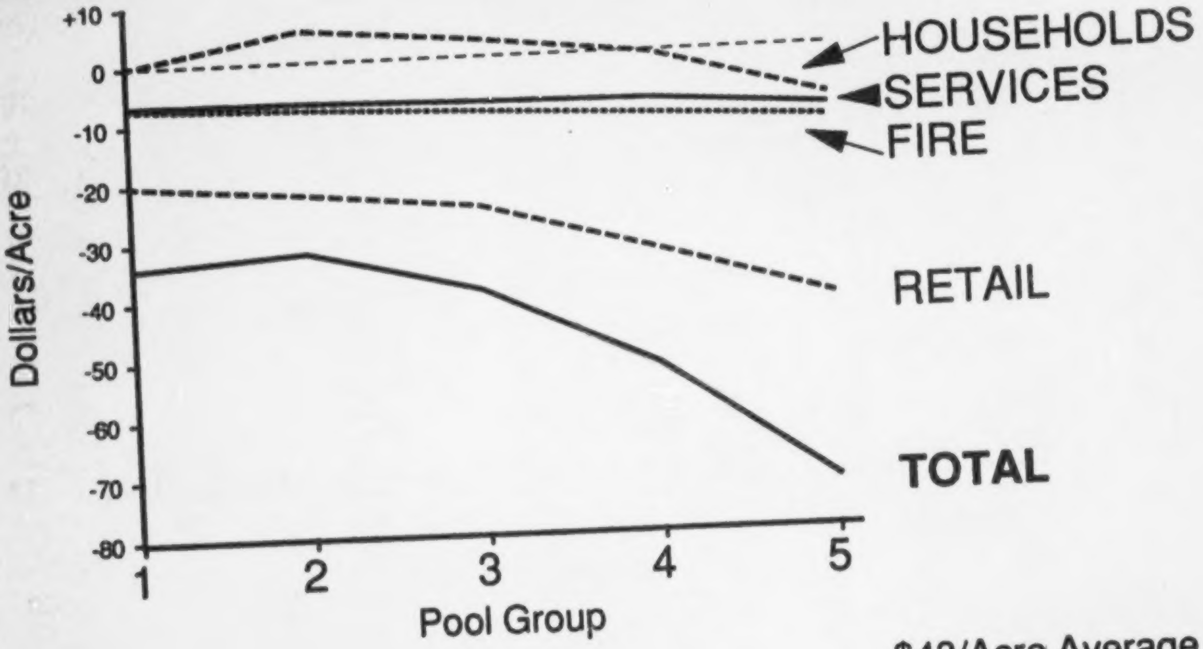
Per acre impacts of CRP by sector...

State average net/acre: -$108.00

NORTH DAKOTA

SOURCE: Dept. of Agr. Econ., North Dakota State University, Fargo

Net direct effects of CRP by economic sector...



$43/Acre Average

Source: Dept. Agr. Econ., North Dakota State University, Fargo.

[From the Forum, March 1, 1989]

CRP AFFECTS NORTH DAKOTA

(By Napoleon Homestead)

The Conservation Reserve Program (CRP) has a national objective of retiring 45 million acres of erodible land by 1990, but the program may bring with it diverse effects on North Dakota's economy, according to a study completed by the department of agricultural economics at North Dakota State University.

Timothy L. Mortensen, research assistant says the department wanted to estimate the economic impact of the CRP on the five different pool areas in the state. "We wanted to estimate if CRP will have an effect on employment and tax receipts."

Mortensen adds that of particular interest are the potential reductions in business volume that could occur. "The impact CRP has on agricultural trade centers in the state could be detrimental, because of the reduction of farm inputs the farmer will use in his operation.

The study found that the direct effect on the state of taking CRP land out of production in 1987 was $56 million in reduced input expenditures, with nearly 62 percent of that impacting the retail sector. Mortensen says this translates into an estimated $141 million in reduced business activity for the state as the change works its way through the economy, with the retail sector again absorbing the greatest impact—nearly 40 percent of the state's total impact.

The largest potential for changes occurred in pool group five (Red River Valley) where business activity was reduced by over $32 million in 1987, or nearly 0.39 percent of the state's total business volume. This occurred even though the Red River Valley had the least amount of land entered into the program, 13.4 percent of the state's total by the fifth signup period in July 1987. Pool group one (southwest North Dakota) was affected the least in terms of reduced business volume, accounting for 15.1 percent of the total impact or just over $21 million.

Almost as striking as the reduced business volume due to CRP is the potential shift in secondary jobs. On a statewide basis, over 2,400 secondary jobs may be lost if alternative activities do not replace changes in agricultural purchases. Secondary jobs are those that provide inputs and services to farm operation suppliers.

While job reductions were not calculated for specific industries, the retail sector is among the hardest hit since it accounts for the largest dollar volume of CRP impact. Pool group two (counties immediately east and north of the Missouri River) may be impacted the most, with the potential for 552 jobs shifting elsewhere.

Mortensen says an analysis of the per acre effects of the CRP on the state's economy reveals that in general these effects are increasingly greater the further east the land. The direct effect of enrollment in CRP is about $34 in pool group one, and nearly $72 per acre in pool group five.

This is due to the more intensive nature of farming in the eastern part of the state, according to Mortensen "Yields, profits and operation inputs are generally higher in the east and can account for this difference."

Although precise values cannot be calculated for individual counties, Mortensen says the counties with the highest enrolled acres will generally be impacted the most. Kidder, Burleigh, Bowman, Eddy and Rolette Counties all had more than 10 percent of their total cropland acres enrolled in CRP through the fifth signup. Businesses in these counties, especially those that are agriculturally related, can expect to feel the impact of CRP to a greater degree than others.

Despite the potential for negative effects, CRP has provided several benefits. A short-run impact has been to increase sales of inputs used for establishing vegetative cover. Progress has also been made in meeting conservation objectives such as reducing soil erosion, increasing wildlife habitat and cover, and increasing water quality.

And since CRP is a ten-year program, researchers have an opportunity to continue to estimate economic impacts and gather information that policy makers can use for future program implementation. "Studies such as these can establish benchmarks for establishing changes in eligibility requirements and analyzing future policies to achieve program goals," says Jay Leitch, associate professor of agricultural economics.

Joining Mortensen and Leitch in completing the study were F. Larry Leistritz, professor, Brenda Ekstrom, research associate and Randy Coon, research specialist in the agricultural economics department.

Senator CONRAD. I would just ask Mr. Gardner to comment.

Mr. Gardner. Well, Senator Conrad, you have raised a number of good points. Let me just say a little about a couple of them. First, I think you are pointing to the problem that arises with the size of the CRP because I believe that the larger it gets the more you run into the problem you are alluding to that the productive losses have a harder time offsetting the environmental benefits. With respect to the ERS study, I agree that it is extremely difficult to measure those benefits and costs correctly. You mentioned the benefit side being perhaps more solid than the cost side, but actually those environmental benefits are extremely difficult to get a good handle on, too. On the cost side, in principle, I agree that the unemployment costs have to be addressed in the CRP, as other adjustment kinds of policies that the Government undertakes.

I do think, though, that when you are talking about a 10-year program, you have to be careful not to take sort of the short-term impacts on communities and count them too heavily over the longer-term. I think in your State it is a particular problem because there it may very well be that there are permanent problems created. But if you put it on a nationwide basis—for example, if you took the 2,400 jobs and took a comparable number across the United States, you would not expect that through the 10 years of the program you would see the unemployment rate going up by that amount. You would see some reallocation of activity, and the costs you would want to count are only the relevant costs. Now I do accept, though, that in North Dakota these adjustments have already been very heavy and are probably different from places that are closer to urban areas, perhaps where there are different, better alternatives.

Senator Conrad. If I might just make one final——

Mr. Gardner. Yes.

Senator Conrad [continuing]. And I appreciate your forthrightness, and I would just indicate that we have counties, we have a city that services a sales area, a trade area. It is on the edge of two counties, and maybe 40 percent of the land in the trade area has been taken out even though there is only 25 percent in any one county. But when a town serves the trade area in two counties and those parts of the counties are the ones that are most heavily in the CRP, and you have 40 percent of the land taken out of production in the trade area of a town, the town is dead. And these are not temporary effects. These are lasting permanent effects that are devastating to the economies of some of these areas, and I just think we have to be terribly sensitive to what we are doing, and ask the hard question as well.

Does it make sense, does it make any economic sense to pay double cash rent to take highly erodible land out? I very much question the effects of that and the unintended consequences of it. Again, I want to thank the patience of the chairman.

Mr. Gardner. May I just ask Mack Gray, who is with me, to respond? I am not sure about that paying double cash rent or what the evidence is or what we know about that situation.

Mr. Gray. Senator Conrad, I am not very well equipped to respond to the one on the cash rent either. I know that ASCS has attempted to determine cash rents, and it has been my understanding that they have attempted to keep them close to cash rents. There may be cases where they have not.

Senator **Fowler**. If you would examine that and give us a written response to that question, I would appreciate it, Mr. Secretary.

Mr. **Gardner**. I would be glad to do so.

[The written response was subsequently supplied by Mr. Gardner and follows:]

Question: **Does it make economic sense to pay "double cash rent" to enroll highly erodible land into the Conservation Reserve Program?**

Answer: The Office of the Inspector General (OIG) and others have correctly reported that the Conservation Reserve Program (CRP) Maximum Acceptable Rental Rates (MARR's) exceed average annual cash rental rates in many areas (Table 1 and Figure 1). MARR's exceed cash rents by an average of $17 per acre in 2,409 counties, about 79 percent of all counties.

However, such a comparison does not necessarily indicate a problem with the current MARR's. Rather, the current MARR's must be compared with adjusted rental rates that are based on current cash rental rates, adjusted to reflect (1) the foregone expected annual return to land and other production resources over the 10-year contract period to owner-operators, and (2) the expense of establishing and maintaining the CRP land cover.

Guidelines issued by the Agricultural Stabilization and Conservation Service (ASCS) to the State and County Committees in early 1988 list the factors to be considered in addition to current cash rents in determining MARR's for CRP acreage. The factors include (1) the expected trends in cash rents, land values, and economic conditions on average quality land over the 10-year CRP contract period, (2) the normal up-front expense to the participant to establish the required cover, plus potential foregone interest on that expense, and (3) the normal expense for maintaining the cover for 10 years.

Calculation of 10-Year Prevailing Local Rates

Annual expected returns to land and other resources associated with the CRP land are based on the 1989 cash rental rates for average nonirrigated cropland in each county. The cash rental rate is assumed to represent the average market return to land from farm production activities. Nonoperator farm landlords would likely expect an annual land return from CRP equal to the current cash rental payment foregone for enrolled acreage. Farm owner-operators owning a complement of additional resources that would be underutilized due to retirement of CRP acreage may experience a larger change in returns and, thus, require a higher CRP rental payment.

The size of the return above cash rents (returns to land) varies by enterprise type and region. For example, for the 1985-87 period, 65 percent of the net returns from all owned resources on U.S. corn farms were returns to land. This percentage varied from 57 percent in the Northern Plains to 69 percent in the Lake States. Average returns to land for all U.S. wheat farms were higher--71 percent, but range from 61 percent in the Southern Plains to 75 percent in the North Central States. For the purposes of this analysis, it is assumed that returns to land are about 67 percent of total resource returns for all counties. Thus, cash rents (returns to land) are increased by 50 percent (0.33/0.67) to approximate total expected returns to all owned production resources.

The adjusted 1989 cash rents are further adjusted to account for anticipated increases over the 10-year period on the basis of the 1970 to 1989 average annual change in land values for each State.

The producer cost of cover establishment plus accrued interest for 10 years includes the average per-acre cost-share assistance payment for the county, amortized for 10 years at the 10-year Treasury note rate for the 12 month period ending October 1989, 8.7 percent. Because of limited availability of data on actual establishment expenses in many counties, the per-acre cost-share average expense for all counties in each NASS statistical district is applied to each county in the district.

The cost of maintaining the CRP land cover includes allowances for annually controlling weeds and provision for the possibility of needing to reestablish the cover because of failure due to drought, flood, or other factors. Annual weed control expense is assumed to equal $5 per acre.

The probability of cover failure on CRP acreage could be expected to vary among regions depending on the variability and amount of precipitation. The probability of cover failure is assumed to be 0.10 for the counties in the Northern Plains, Southern Plains, Mountain, and Pacific regions and 0.05 for the remainder of the country. The annual expected cost of reestablishment is calculated as the product of the probability of cover failure and the cost of cover establishment. The expense of the cover reestablishment is assumed to be cost shared at the current 50-percent level.

The expenses for maintenance and reestablishment are adjusted each year for 10 years by the average change in the index of prices paid by farmers for production inputs during the 1974 to 1989 period, 4.6 percent.

Calculation of the average 10-year rental rate for each county is completed in two steps. First, the present value of the estimated per-acre 10-year annual stream of expected returns, establishment costs, and maintenance costs is calculated. Second, the present value of the returns and costs stream is amortized over the CRP contract period to obtain the 10-year annual rental rate. The same interest rate, 8.7 percent, is used to calculate and amortize the present value of the returns and costs. The 8.7-percent present value discount rate is calculated as the average annual estimated interest rate for Moody's Aaa bonds for 1991 through 2000 and is used in preparation of the President's Budget Submission for January 1990. It is also equal to the 10-year Treasury note rate used to amortize cover establishment costs.

Comparison of MARR's with Calculated 10-Year Prevailing Local Rental Rates

County-level comparisons of MARR's and 10-year rental rates are summarized in Table 2 and Figure 2. The 10-year prevailing local rental rates included in the comparison represent the expected foregone returns and cover establishment and maintenance costs for an owner-operator. As indicated earlier, computed 10-year rents for owner-operators include returns to nonland resources.

About 7 percent of U.S. counties, 208, have computed 10-year average rental rates that exceed the MARR's for those counties. On the average, the MARR's exceed the computed rates by only $4. In certain counties, the MARR's may exceed the 10-year rate by a greater amount, up to $26 per acre. States with the largest number of counties and the largest eligible acreage having MARR's that exceed prevailing rates are located in the Appalachian, Northern Plains, Southern Plains, and Mountain regions.

However, no enrollment is likely to occur in 116 of the 208 counties because either no acreage has been enrolled through the ninth signup or the counties have already met the 25 percent of total cropland enrollment limit. Thus, active enrollment is likely to occur in only 92 counties where MARR's exceed 10-year rental rates. Fifty-five of these counties are located in the Plains and Mountain States. The remaining 37 counties are largely located in less productive areas (low average rents) scattered across the eastern States.

MARR's exceed pool-average rates in four pools involving Colorado, Nevada, Utah, and Wyoming (Table 3 and Figure 3). The 10-year rate is calculated for each pool as the average of the rates of the counties in the pool. Each county rate is weighted by the estimated acreage of cropland eligible for enrollment in CRP in that county. The average difference between the MARR's and the 10-year rates ranges from $2 to $5. Active enrollment is likely to occur in only 20 of the counties included in the four pools. The other counties have either reached the 25-percent limit or not enrolled any acreage during the first nine signups. Further, about 63 percent of the cropland in these 20 counties is irrigated. However, the calculated 10-year rental rates reflect returns and costs for only nonirrigated cropland. Calculated rates for the 20 counties based on irrigated cropland rental rates would greatly exceed the current MARR's.

Caveat

1. Returns to farm owner-operators with expected returns from farming equal to 150 percent of the annual cash rent are used to calculate the 10-year rent standard for comparison with

existing MARR's. Use of a different expected return would change the calculated 10-year rate and affect the number of counties exceeding that standard.

2. The analysis calculates the 10-year rental rates to represent rental rates on nonirrigated land. Consequently, the 10-year rates are often lower than MARR's in arid, heavily irrigated areas. If policymakers intended that the MARR's be established to encourage enrollment of irrigated acreage, then the MARR/10-year rent comparisons are inappropriate in those areas.

SUMMARY:

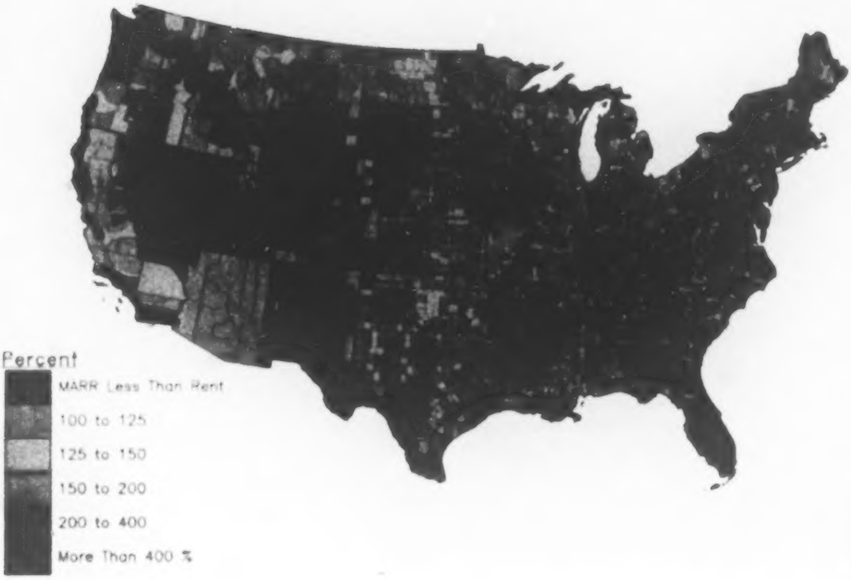
Offering payments equal to annual cash rental rates that impose no out-of-pocket obligations to obtain 10-year leases on CRP acreage with cover establishment and maintenance requirements is inappropriate and would likely have resulted in extremely low enrollment.

When compared with estimated 10-year rental rates that include cover establishment and maintenance allowances, the MARR's exceed such rates in 208 individual counties by an average of only $4 per acre. Active enrollment is expected in only 92 of these counties because the others have either reached the 25-percent limit or not enrolled any acreage during the first nine signups.

MARR's exceed pool-average 10-year rates in four pools involving Colorado, Nevada, Utah, and Wyoming by $2 to $5. Active enrollment is expected in only 20 counties included in these pools because the others have either reached the 25-percent limit or have had no enrollment during previous signups. About 63 percent of the cropland in these 20 counties is irrigated. However, the calculated 10-year rental rates reflect returns and costs for only nonirrigated cropland. Calculated 10-year rates for the 20 counties based on irrigated cropland rental rates would greatly exceed the current MARR's.

FIGURE 1

RATIO OF MARR TO CASH RENTAL RATE



ASCS-PAD

TABLE 1. HARR'S AND COUNTY ANNUAL CASH RENTS, BY STATE

REGION AND STATE	HARR ≤ CASH RENT					HARR > CASH RENT				
	COUNTIES	DIFFERENCE AVG.	MIN.	MAX.	ELIGIBLE ACRES	COUNTIES	DIFFERENCE AVG.	MIN.	MAX.	ELIGIBLE ACRES
	NUMBER	DOLLARS PER ACRE			(1,000)	NUMBER	DOLLARS PER ACRE			(1,000)
NORTHEAST										
CONNECTICUT	4	26	5	37	29,400	4	8	6	17	23,200
DELAWARE	1	8	8	8	14,100	2	20	9	33	11,100
MAINE	3	4	4	4	114,275	15	19	7	37	30,056
MARYLAND	1	4	4	4	700	22	32	5	41	430,800
MASSACHUSETTS	10	21	5	38	39,500	3	11	0	17	10,600
NEW HAMPSHIRE	1	21	21	21	2,400	9	12	3	26	21,400
NEW JERSEY	1	0	0	0	8,000	20	24	8	52	187,135
NEW YORK	2	11	5	41	62,600	54	21	1	40	1,162,700
PENNSYLVANIA	2	33	2	34	132,700	64	31	2	53	1,040,190
RHODE ISLAND	5	24	6	45	3,300	0	0	0	0	0
VERMONT	1	6	6	6	3,400	13	27	15	41	65,200
APPALACHIAN										
KENTUCKY	53	15	2	33	1,140,386	67	13	0	45	905,500
NORTH CAROLINA	45	15	4	40	460,459	55	12	1	27	1,108,041
TENNESSEE	30	8	4	20	475,304	65	11	1	20	1,555,432
VIRGINIA	7	4	0	12	46,000	90	27	4	50	858,109
WEST VIRGINIA	3	8	5	17	13,600	52	22	2	40	218,000
SOUTHEAST										
ALABAMA	7	8	3	14	214,760	60	14	2	31	1,107,793
FLORIDA	32	49	0	75	290,500	35	14	5	28	178,516
GEORGIA	18	3	1	35	134,225	141	16	2	34	994,696
SOUTH CAROLINA	1	3	3	3	438	45	21	3	33	453,296
DELTA										
ARKANSAS	10	7	2	15	55,032	65	11	1	37	645,530
LOUISIANA	28	10	2	31	120,522	35	10	0	26	142,530
MISSISSIPPI	29	7	3	15	309,151	62	10	3	33	1,203,529
CORN BELT										
ILLINOIS	32	9	2	22	1,299,000	70	13	0	50	2,720,600
INDIANA	39	13	4	39	759,205	53	10	0	24	1,374,965
IOWA	76	14	1	44	7,214,250	24	7	0	28	1,640,000
MISSOURI	45	10	2	21	2,000,203	70	10	2	31	2,496,346
OHIO	14	8	3	17	154,620	75	15	0	51	1,375,202
LAKE STATES										
MICHIGAN	6	2	1	6	73,500	77	15	1	36	759,694
MINNESOTA	32	8	1	22	1,142,042	50	8	0	21	1,624,466
WISCONSIN	16	13	1	23	1,060,600	56	11	0	26	1,936,610
NORTHERN PLAINS										
KANSAS	2	10	0	10	97,900	103	28	5	39	7,073,675
NEBRASKA	10	7	1	12	1,326,600	75	19	1	45	3,792,973
NORTH DAKOTA	7	3	1	6	229,330	46	14	3	21	2,904,194
SOUTH DAKOTA	5	1	0	3	180,100	61	21	3	29	1,942,150
SOUTHERN PLAINS										
OKLAHOMA	4	4	0	12	17,306	73	16	0	28	2,957,272
TEXAS	11	3	1	12	1,221,322	243	15	0	43	12,882,477
MOUNTAIN										
ARIZONA	0	0	0	0	0	15	14	14	19	196,000
COLORADO	1	0	3	3	0	61	24	6	44	5,405,577
IDAHO	9	9	0	22	750,000	35	17	5	32	1,682,247
MONTANA	0	0	0	0	0	58	15	1	25	8,301,400
NEVADA	0	0	0	0	0	17	29	29	29	196,000
NEW MEXICO	0	0	0	0	0	31	22	14	30	807,251
UTAH	0	0	0	0	0	20	27	11	34	532,111
WYOMING	0	0	0	0	0	23	28	25	30	409,001
PACIFIC										
CALIFORNIA	13	18	6	34	[illegible]4,200	45	22	1	46	657,796
OREGON	12	20	6	48	80,300	24	7	0	29	1,155,716
WASHINGTON	28	5	2	47	1,062,406	11	11	2	20	750,073
UNITED STATES	655	11	0	75	24,227,750	2,400	17	0	53	78,334,251

FIGURE 2

RATIO OF MARR TO TEN--YEAR RENTAL RATE

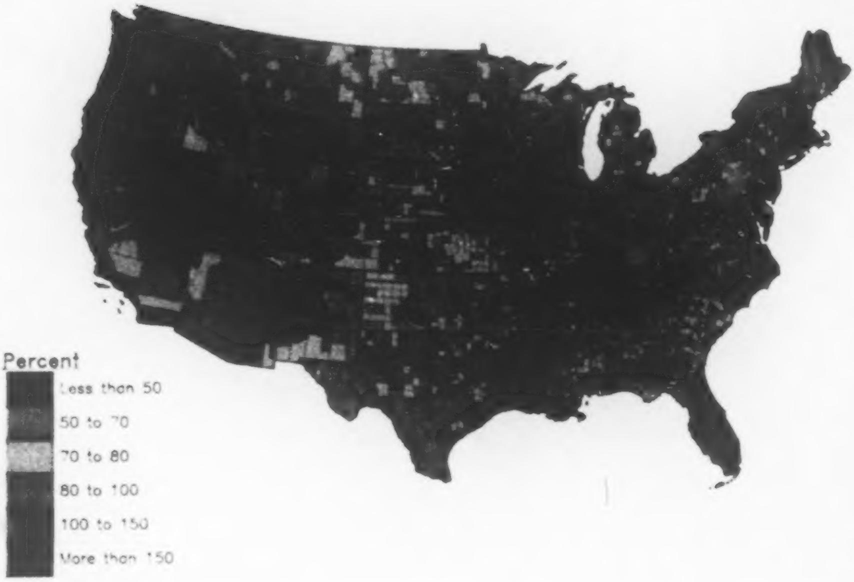


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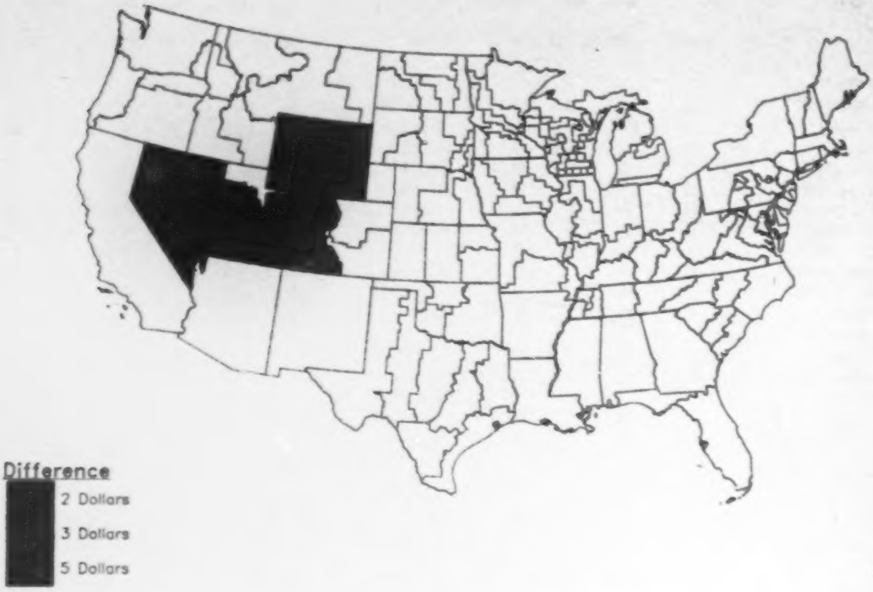
TABLE 2. MARR'S AND COUNTY 10-YEAR RENTAL RATES, BY STATE

REGION AND STATE	MARR ≤ 10-YEAR RATE					MARR > 10-YEAR RATE				
	COUNTIES	DIFFERENCE			ELIGIBLE ACRES	COUNTIES	DIFFERENCE			ELIGIBLE ACRES
		AVG.	MIN.	MAX.			AVG.	MIN.	MAX.	
	NUMBER	DOLLARS PER ACRE			(1,000)	NUMBER	DOLLARS PER ACRE			(1,000)
NORTHEAST										
CONNECTICUT	8	102	41	159	52,000	0	0	0	0	0
DELAWARE	3	105	31	155	25,200	0	0	0	0	0
MAINE	16	93	1	106	144,931	0	0	0	0	0
MARYLAND	23	41	7	94	439,500	0	0	0	0	0
MASSACHUSETTS	13	107	44	168	58,100	0	0	0	0	0
NEW HAMPSHIRE	10	69	27	142	23,000	0	0	0	0	0
NEW JERSEY	20	59	30	96	174,935	1	7	7	7	10,200
NEW YORK	54	43	2	160	1,176,000	2	3	3	4	40,700
PENNSYLVANIA	58	48	3	102	1,089,315	8	6	2	25	111,583
RHODE ISLAND	5	140	106	201	3,300	0	0	0	0	0
VERMONT	13	25	1	94	66,200	1	9	9	9	2,400
APPALACHIAN										
KENTUCKY	119	79	5	132	2,051,986	1	7	7	7	2,900
NORTH CAROLINA	100	51	7	137	1,640,500	0	0	0	0	0
TENNESSEE	95	60	16	110	2,030,737	0	0	0	0	0
VIRGINIA	83	35	1	100	675,200	14	7	0	15	228,900
WEST VIRGINIA	46	48	3	111	209,900	9	6	0	19	22,500
SOUTHEAST										
ALABAMA	66	40	3	86	1,315,461	1	3	3	3	7,100
FLORIDA	67	110	3	213	469,016	0	0	0	0	0
GEORGIA	156	33	3	131	1,123,021	3	7	5	8	5,100
SOUTH CAROLINA	43	18	3	61	440,061	3	3	1	6	13,674
DELTA										
ARKANSAS	70	40	3	87	606,997	5	5	3	11	13,573
LOUISIANA	63	48	5	109	263,050	0	0	0	0	0
MISSISSIPPI	81	46	5	85	1,592,460	1	6	6	6	220
CORN BELT										
ILLINOIS	102	80	9	137	4,020,400	0	0	0	0	0
INDIANA	92	78	33	156	2,134,170	0	0	0	0	0
IOWA	100	103	50	162	8,054,250	0	0	0	0	0
MISSOURI	115	71	8	109	5,384,549	0	0	0	0	0
OHIO	85	50	3	117	1,477,322	4	5	3	8	52,500
LAKE STATES										
MICHIGAN	77	41	1	82	814,894	6	4	1	5	18,300
MINNESOTA	90	63	5	125	2,767,100	0	0	0	0	0
WISCONSIN	72	72	10	131	2,997,210	0	0	0	0	0
NORTHERN PLAINS										
KANSAS	98	18	0	68	6,007,906	7	5	1	9	1,163,069
NEBRASKA	82	49	0	94	4,583,650	11	2	0	22	535,923
NORTH DAKOTA	53	22	4	60	3,133,531	0	0	0	0	0
SOUTH DAKOTA	60	15	1	62	2,006,909	6	2	1	3	123,261
SOUTHERN PLAINS										
OKLAHOMA	77	23	3	80	2,974,570	0	0	0	0	0
TEXAS	232	28	1	79	13,078,794	22	3	1	18	225,006
MOUNTAIN										
ARIZONA	15	24	14	24	196,000	0	0	0	0	0
COLORADO	32	19	1	66	4,134,645	30	3	1	21	1,350,033
IDAHO	43	46	3	100	2,409,247	1	4	4	4	12,600
MONTANA	56	16	0	51	8,601,400	0	0	0	0	0
NEVADA	0	0	0	0	0	17	5	5	5	196,900
NEW MEXICO	16	8	1	22	800,051	15	4	2	8	78,400
UTAH	14	9	2	39	270,911	15	7	4	16	261,200
WYOMING	3	1	1	2	34,100	20	3	1	9	434,981
PACIFIC										
CALIFORNIA	53	34	6	124	752,696	5	20	7	26	10,300
OREGON	36	51	5	170	1,216,016	0	0	0	0	0
WASHINGTON	30	68	23	151	2,012,569	0	0	0	0	0
UNITED STATES	2,856	47	0	213	90,014,201	200	4	0	26	4,947,823

Figure 3

MARR GREATER THAN TEN-YEAR RENTAL RATE
By CRP Bid Pool



ASCS-PAD

Table 3. CRP Bid Pools Having MARR's Greater Than the Pool Average 10-Year Rental Rates

State	Pool	Enrolled Acres 1/	MARR	10-Year Rate	Difference
Colorado	1	130,501	50	47	3
Nevada	1	3,181	40	35	5
Utah	2	117,759	40	39	1
Wyoming	1	255,553	40	37	3

1/ Projected enrollment through the ninth signup.

Senator **Fowler**. Before we go vote, let me just ask you one question. Since wetland restoration and protection is one of the most controversial parts in North Dakota and elsewhere, how do you describe the working relationship between USDA and the Fish and Wildlife Service? For instance, is the Fish and Wildlife Service content to be consulted on departmental wetland initiatives or are they basically seeking a veto over that?

Mr. **Gardner**. Well, I think that they definitely want to be consulted. I do not know that they are asking for a veto.

Senator **Fowler**. So things are cooperative and coordinated?

Mr. **Gardner**. Well, given the——

Senator **Fowler**. No problems that you need to discuss in public? [Laughter.]

Mr. **Gardner**. There are inevitable problems that sometimes arise because of different objectives of different agencies, but given that as a background, it seems to me we do cooperate.

Senator **Fowler**. Do you have an estimate handy on the potential in number of acres for wetland restoration on agricultural lands?

Mr. **Gardner**. You hear quite large numbers like 70 million acres, but I think I will ask Mack Gray.

Senator **Fowler**. What do you think? Or Mr. Gray?

Mr. **Gardner**. Let us make it Mr. Gray. He knows more.

Mr. **Gray**. We have about 70 million acres of cropped wetlands in this country, but I doubt that there is any likelihood that anything like that number of acres would ever be considered, that people would consider putting them into a reserve. We have estimated in Soil Conservation Service that there may be as many as 5 million acres around the country that would have a potential and I would say a moderate potential to come into a reserve such as a wetland reserve.

Senator **Fowler**. Does the Department support a flexible or graduated penalty for wetland violations?

Mr. **Gardner**. You mean some modification of the drop dead provision?

Senator **Fowler**. Yes.

Mr. **Gardner**. As it is called. Well, we have not made a formal proposal on that, but it does seem that cases arise where a minor violation by a producer can result in such a large penalty that it does violate your sense of fairness in these things, and so I think we do see that aspect of it.

Senator **Fowler**. I think we need a policy, and we would like to have your recommendations. I thank you both.

Ladies and gentlemen, it will take us about 20 minutes probably, and we have two panels, and we will be back.

[Recess.]

Senator **Fowler**. Ladies and gentlemen, we will resume our hearing. We will welcome up to the table Mr. Robert Warrick, a farmer with the Sustainable Agriculture Coalition in Meadow Grove; Mr. Doug Nebel, another farmer; Mr. Frank Jones, the chairman of Special Committee on Environmental Issues of the National Cotton Council in Texas; Mr. Robert Wetherbee, the president of the National Association of Conservation Districts from Fairmount, North Dakota; and Mr. Layton Hoysler, the president of the American Society of Farm Managers and Rural Appraisers, from Faribault, Minnesota. Gentlemen, we welcome you. Thank you for your patience in our ongoing legislative wars. I am talking about ones on the floor now, not here. And your complete statements will be made a part of the record. If you could summarize, that will enable at least Mr. Grassley and I to have some conversation with you. Again, Mr. Warrick, a Nebraskan farmer, welcome, sir.

STATEMENT OF ROBERT WARRICK, FARMER, SUSTAINABLE AGRICULTURE COALITION, MEADOW GROVE, NE

INTRODUCTION

Mr. **Warrick**. Senator Fowler and members of the subcommittee, my name is Robert Warrick. I am representing the Sustainable Agriculture Coalition. I farm in northeast Nebraska near Meadow Grove and I am on the board of the Center for Rural Affairs.

I want to submit my prepared statement for the record, and also the Conservation Policy Options of the Sustainable Agriculture Working Group. I want to start off by thanking you very much for your introduction approximately 2 years ago of S. 970, Agricultural Conservation and Water Protection Act. I really believe that your efforts set the agenda for the 1990 farm bill debate.

Senator **Fowler**. Thank you.

Mr. **Warrick**. And the Sustainable Agriculture Working Group has been developing and working closely along those guidelines to develop a sustainable agriculture policy for the 1990 farm bill.

1985 FARM BILL

To briefly summarize my statement, I did play an active role in writing the 1985 farm bill in its conservation section. I think it set new standards as was said previously by Worldwatch Institute that the United States is a leader in conservation now, and we want those sections maintained and strengthened.

ONE OF THE GREATEST IMPEDIMENTS TO MY FARMING OPERATION HAS BEEN THE INFLEXIBILITY OF PAST FARM PROGRAMS

However, saying that, as a farmer I also farm under farm programs. And I raise livestock, and I raise a lot of alfalfa, and one of the greatest impediments to my farming operation has been the inflexibility of past farm programs. I have had farm conservation plans for my farm since I have started farming since I got out of the military. I believe the greatest impediment to good conservation is the inflexibility of past farm programs. I want to encourage your committee to make the 1990 farm bill more flexible so that farmers can plant a variety of crops and remove barriers for the adoption of sustainable agriculture.

I WANT YOU TO INTRODUCE A PROGRAM THAT WOULD GIVE PARTICIPANTS IN THE FARM PROGRAM THE BENEFITS OF THE FARM PROGRAM BUT ALSO GIVE THE FLEXIBILITY TO PLANT CROPS AS THEY DESIRE

Specifically, I want you to introduce a program that would give participants in the farm program the benefits of the farm program but also give the flexibility to plant crops as they desire. Under this program, I would certainly support the normal crop acreage (NCA) program, which includes *all* crops. This would give farmers a flexibility and an historic base for all crops and allow a greater cropping flexibility.

WE SUPPORT ALL THE CONSERVATION SECTIONS THAT WERE WRITTEN IN 1985 AND WANT THEM STRENGTHENED

We support all the conservation sections that were written in 1985 and want them strengthened, especially the key standards under the compliance section. We fully support those. We support strengthening swampbuster, making drainage the violation. We support increasing the CRP acres to 45 million, and think that that was one of the greatest programs that was instituted.

CONCLUSION

I want to thank you for this time to testify. Again, as a farmer, it really behooves this committee to take a strong look at the flexibility programs in the past and hopefully under your leadership and the type of legislation that you introduced in S. 970, we can proceed along those lines. Thank you very much.

Senator FOWLER. Thank you, Mr. Warrick, very much, and I appreciate your comments and your commendations, and we will, we are looking very closely at those flexibility provisions.

Mr. WARRICK. If there are any questions you would like to ask, I would be pleased to answer them.

Senator FOWLER. I think we will go through the whole panel and then we will have discussion. Thank you.

Mr. WARRICK. OK.

[The prepared statement and attachment, Conservation Policy Options, of Mr. Warrick follow:]

TESTIMONY OF ROBERT WARRICK
ON BEHALF OF THE SUSTAINABLE AGRICULTURE COALITION
TO THE SENATE AGRICULTURE CONSERVATION AND FORESTRY SUBCOMMITTEE

MARCH 29, 1990

Senator Fowler and Members of the Subcommittee, my name is Robert Warrick. I am representing the Sustainable Agriculture Coalition, which includes 12 grassroots organizations working directly with farmers practicing sustainable agriculture. I farm in Northeast Nebraska, near Meadow Grove and am on the board of the Center for Rural Affairs. It gives me a great deal of pleasure to be able to testify to you today on the proposed Conservation Section of the 1990 Farm Bill.

This is the second farm bill in which I have played an active role. I was actively involved in shaping the 1985 Farm Bill and its conservation section and am very pleased to see the conservation awareness and stewardship that the 85 Farm Bill has generated across the United States. I am again excited by the prospects of more conservation and environmental protection being considered for the 1990 Farm Bill, for I believe that farmers, if given the right signals and incentives from the federal government, do want to be good stewards of our soil and water resources.

As a farmer who believes in sound conservation practices and who has practiced them as long as I have farmed, I can tell you that one of the greatest impediments to my farming in a more environmentally sound way has been the inflexibility of past farm programs. I raise livestock on my farm and thus I have a rotation program that includes legumes that I grow for hay. Thus while I have a good conservation plan for my farm and have had for over 30 years, I have a very small feed grain base in relation to the land that could raise those crops. At the same time in my county, many farmers have adapted to the farm programs by becoming large-scale, highly-specialized high-input farmers, often farming highly erodible land with a 100% feed grain base.

This inflexibility of past farm programs, I believe, has been a major factor in increased erosion and in my area, groundwater depletion, and has also caused major groundwater pollution problems. In many areas the problem is increasing at an alarming rate, especially in Nebraska. Just this month, my local Natural Resource District designated an area as a problem area because the nitrate contamination in the groundwater has increased above the safe level for drinking.

May I encourage you and your Committee to make the 1990 farm bill more flexible so that farmers can plant a variety of resource conserving crops. The farm programs should remove barriers to adoption of sustainable agricultural practices, such as including conserving crops like alfalfa in rotations, and instead reward stewardship.

Specifically, I urge you to create a special program to provide additional flexibility and benefits for farmers who develop and implement a plan that would, over a period of time, limit chemical use to low levels, protect water quality and hold soil erosion to rates that do not threaten long term soil productivity. During this time, participants' payments yields should not be adjusted downward and set-aside requirements should be reduced to the extent the farmers' crop rotations contribute to the supply control objectives of the farm program. Payments should be made on the acres devoted to short term rotational stands of resource conserving crop, at least equal to the payments received for planting program crops. This might be accomplished by cost share for establishment of conserving crops, special stewardship payments or by allowing farmers to draw payments on land planted to conserving crops as if it had been planted to a program crop. Whatever the mechanism, this payment should be equally available to farmers who have small program crop bases due to historic use of resource conserving rotations. Farmers receiving the payment should be allowed to harvest the conserving crop. Finally, if we retain crops specific bases, farmers in this special program should be allowed to gradually swap bases among program crops.

Second, but of equal importance is the necessity of switching back to a normal crop acreage approach (NCA), which includes all crops. This would give each farm one historic base for all crops and would allow for greater cropping flexibility. A farmer would then be able to include soil-building crops in rotations. This NCA should include land only if it can be cropped without excessive erosion. (This would build on the Conservation Compliance Section of the 85 Farm Bill.) However, I repeat and stress that payments must also be redirected so that sustainable farmers with rotations which include soil-building crops receive payments equal to those received by continuous corn and wheat producers. This requires target prices for alternative crops that encourage their inclusion in sustainable rotations.

We support strengthened enforcement of the Conservation Compliance provisions of the 1985 Farm Bill, according to the soil loss tolerance standard ("T"), except in individual hardship cases. We support efforts to reform Farmers Home Administration Soil & Water Programs to prohibit loans for environmentally degrading purposes such as forest clearing and wetland drainage. The primary purpose of the SW program should be to assist moderately sized, limited resource farmers in meeting conservation requirements. Compliance and sodbuster should be applied to all government programs that farmers profit from, not only commodity programs. Swampbuster needs enforcing, making drainage the violation rather than the growing of program commodities. Funds for creating and protecting wetlands need to be increased. We support the Conservation Reserve Program (CRP) and encourage fulfillment of its goal of retiring 45 million acres of highly erodible cropland. We feel the CRP should be targeted to areas of environmental sensitivity, and especially toward the higher rainfall areas of the eastern cornbelt. The future acres that come out of the CRP should be subject to the sodbuster rule. We also support allowing CRP benefits to be extended to partial fields for field windbreaks (both trees and grass), shelterbelts, contour grass strips for erosion control and sink holes (permanent easements). Finally, we support review and revision of the Universal Soil Loss Equation (USLE) to fully account for the soil conserving benefits of the cover crops and sod based rotations used by sustainable farmers. The USLE does not consider the long term cumulative beneficial effects of such practices on soil tilth and consequent increased water infiltration and reduced erosion.

Thank you for this time to testify. I am including for the record a copy of the complete Conservation Policy Options of the Sustainable Agriculture Working Group, which we support. If there are any questions, I would be pleased to try and answer them.

SUSTAINABLE AGRICULTURE WORKING GROUP

February, 1990

CONSERVATION POLICY OPTIONS

GOAL: To design federal conservation programs to maximize conservation of natural resources.

Introduction

Sustainable agriculture systems emphasize working in concert with nature. Typically, such systems conserve soils through crop selection, use of cover crops, crop residues, contour farming and other practices. Water quality is protected by replacing petrochemicals with legumes, animal manures, crop rotations, light cultivation and careful management. Energy is conserved by improving energy efficiency and developing alternative, renewable sources of energy. In addition, practitioners of sustainable agriculture generally regard wetlands and wildlife as valuable components of the rural landscape. Wetlands filter chemicals and sediments from runoff and help soak up water during high rainfall or spring thaw, reducing flooding problems. The numbers and diversity of wildlife help gauge the general health of local ecosystems and enrich the countryside with beauty, as well as economic opportunity. With these factors in mind, a number of conservation issues are pertinent to the next Farm Bill. These subjects include conservation compliance and sodbuster, wetlands, the Conservation Reserve Program, and the multi-year set-aside.

Highly Erodible Land: Conservation Compliance and Sodbuster

The highly erodible land conservation provisions in the 1985 Food Security Act, known as conservation compliance and sodbuster, condition receipt of federal farm program benefits on proper stewardship of soil resources, thereby decreasing the federal government's role in subsidizing excessive erosion. Compliance requires producers who farm highly erodible land to have an SCS-approved conservation plan by 1990 and have it implemented by 1995 to remain eligible for farm subsidies. Sodbuster denies benefits to producers who convert highly erodible pasture, rangeland or forest to crop production, unless the producer applies basic conservation practices.

The Sustainable Agriculture Working Group (SAWG) supports full implementation of conservation compliance and sodbuster with the following priorities:

1. **Restore effective implementation of compliance.** The compliance provision has been steadily undermined by weak rules and administrative decisions of the Soil Conservation Service (SCS). Blanket use of alternative conservation systems (ACS) fails to reduce erosion to tolerable soil loss levels (T). Soil loss often exceeds the annual rate of erosion that will permit sustained cropping without endangering long-term productivity. In some cases, ACSs sanction erosion rates several times T, but no environmental assessment has been done to analyze the impact of weakening compliance.

2. **Reinstate T as a basic program objective for compliance and set an upper limit on allowable soil erosion.** Erosion above the T to 2T level should only be permitted where economic analysis reveals a legitimate hardship associated with meeting the basic standard. Standards should be developed for measuring and addressing undue economic hardship by considering factors that include eigibility for the Conservation Reserve Program (CRP), farm practices, the producer's income and the producer's need to rely on farm income.

3. **Change commodity program provisions which conflict with the compliance provision by discouraging farming pratices such as soil-conserving crop rotations.** These conflicts should be eliminated, enabling producers to meet compliance requirements without losing base or farm program payments.

4. **Provide farmers with financial assistance for implementing their conservation plans either through additional cost-share funding or loans.** Agricultural Conservation Program (ACP) funding should be increased substantially and targeted to highly erodible land subject to compliance and to small producers facing economic hardship.

5. **Reform Farmers Home Administration Soil and Water (SW) Loan Program to prohibit loans for environmentally degrading purposes such as forest clearing and wetland drainage.** The primary purpose of the SW program should be to assist moderately sized, limited resource farmers in meeting conservation requirements.

6. **Apply compliance and sodbuster to all government programs that farmers profit from, not only commodity programs.** Currently, the measures are only as strong as the incentive to participate in farm programs, which could be disastrous for natural resources during periods of high prices for major commodity crops. Possible ways that this could be achieved include extending the conservation provisions to all Farm Credit System and secondary market borrowers and to all users of below-cost federal reclamation water. Further, farm program benefits should be withheld from producers who "sodbust" highly erodible land even if they do not raise a crop on the land.

7. **Review the Universal Soil Loss Equation (USLE) and SCS technical guides to determine whether adequate credit is given to the potential erosion reductions from low-input, sustainable practices.** This would include crop rotations and smaller field size, practices that can significantly increase soil organic matter and soil tilth - important factors in preventing runoff.

Wetlands Conservation

It has been estimated that wetlands are disappearing at a rate of 275,000 or more acres annually. Drainage for agriculture is responsible for a high percentage of the loss. The Working Group is concerned with the continuing loss of wetlands in this country and recommends the following:

1. **Develop a no-net-loss wetland policy.** Such an approach might include a program whereby wetlands are taken into consideration as farmers develop a comprehensive wildlife plan for their land, in consultation with the Fish and Wildlife Service and the SCS. In this case, the farmer might be allowed to drain "nuisance spots" if he or she already had successfuly created or restored a wetland in another area (in this case, the new wetland would need to be considered "natural" so that swampbuster would apply to it the same as it would apply to the original drained acreage.) A no-net loss policy should not become a license to drain existing wetlands now in the hope that new wetlands would be created later. Rather, mitigation should take place before drainage is permitted.

2. **Strengthen and maintain swampbuster by making drainage the violation, rather than the act of planting a commodity crop on the drained land.** At this time, a wetland can be drained with no penalty. This greatly diminishes the law's effectiveness and leads to numerous administrative problems. A farmer can convert a wetland, and then plant crops in only those years when he or she does not intend to apply for agricultural subsidies, or the wetland can be hayed without jeopardizing benefits. Regulators should be encouraged to use, and trained to consistently use, the law's "minimal effects" exemption for "wet areas" that truly provide minimal resource benefits. SAWG also endorses reducing swampbuster's penalty for first-time violators, but only in return for complete restoration of the wetlands in question. These changes will help farmers who inadvertently drained land subject to the law and help keep swampbuster politically viable.

3. **Increase funding for USDA's Water Bank Program (WBP).** This ten-year reserve program pays landowners not to drain or alter existing wetlands that are identified as prime waterfowl habitat

in the Prairie Pothole Region. Consideration should be given to enlarging the WBP to include more areas where important wetland resources have a high potential for funding.

4. **Fund wetland restoration programs, particularly programs that would provide long-term or permanent easements similar to Sen. Fowler's Farm Conservation and Water Protection Act of 1989 (S.970).**

5. **Maintain the cropped wetland sign-up for the ten-year Conservation Reserve Program (CRP).** This opportunity improves the program's benefits to water quality and wildlife. However, the wetlands retirement option should give more attention to restoration of wetland character on enrolled acreage to make sure taxpayers receive maximum return for their investment.

Conservation Reserve Program (CRP)

The Conservation Reserve Program goal is to take 40-50 million acres of highly erodible cropland out of production for ten years, plant them with soil-holding covers of grasses, trees and shrubs, or restore them as wetlands. Eligibility requirements have been modified in several ways over time to encourage participation and improve the program's benefits for water quality and wildlife, and to increase tree planting. Erosion criteria have been reduced for tree planting contracts, and eliminated for planting filter strips along waterways or around wetlands. Cropped wetlands became eligible for the CRP in 1989 as a compromise to help appease farmers angry with swampbuster. Through the eighth signup in February, 1989, about 30.5 million acres had been approved, with estimated annual soil savings of nearly 20 tons per acre.

The Sustainable Agriculture Working Group supports the concept and goals of the CRP and recommends the following priorities for action:

1. **Require erodible CRP acreage that is cultivated in the future to meet T, in order for the landowner to recieve any USDA supports.** New contracts for highly erodible lands should be subject to the sodbuster rule which is more stringent than conservation compliance.

2. **Offer a tree bonus to provide added incentive for this conservation practice, particularly in the Midwest.** The bonus might take the form of extra cost-sharing to pay establishment and early maintenance costs, or extended contracts for tree planting. Pastureland could be allowed into the CRP for tree planting contracts.

3. **Expand CRP to selectively include environmentally sensitive cropped lands where land retirement seems to be the best solution to curb erosion and protect water quality.** Such situations may include areas around sinkholes, certain critical groundwater recharge areas, filter strips (allowed in the CRP now), shelterbelts that serve as wildlife areas, and field windbreaks of trees or prairie grasses.

4. **Encourage better geographic distribution by emphasizing water erosion problems, with less emphasis on wind erosion in CRP eligibility.** Wheat base acres enrolled could be limited to specific cover practices, including tree planting, windbreaks, wetland restoration or buffer strips.

5. **Encourage ASCS to provide greater vigilance over accepted rental rates and protection of tenant rights.**

6. **Consider permanent easements targeted to the most environmentally sensitive land.** Permanent easements provide long-term protection, often for not much more money than ten-year contracts that provide for a relatively high taxpayer investment.

Multi-year Set-Aside

Annual set-aside programs have been used since 1961 to provide flexible control of farm commodities. While such programs have great potential for allowing limited rotations that would conserve resources and disrupt pest cycles, they have often fostered practices that cause soil erosion, water pollution and loss of wildlife. Problems generally result from lack of cover caused by late planting or complete neglect. This situation could be improved by requiring that a certain percentage of diverted lands be set aside for three to five years, with management requirements that include planting legume and/or grass cover to protect soil and water, provide nitrogen and organic matter to the soil, and offer rotation benefits that help control crop pests. The need for a multi-year set-aside was highlighted when CRP lands were opened for haying during the drought in 1988 and 1989. Only a short time before, USDA had opened up annual acres for haying and grazing, but cover was so scanty or nonexistent that it provided little value as livestock forage.

To encourage resource-enhancing cover practices on set-aside acres, the Working Group urges Congress to require USDA to institute multi-year set-aside contracts for a minimum period of three years, requiring that a certain percent of the land taken out of production each year be included in such multi-year contracts. Highly erodible land should have priority when establishing semi-permanent cover. Other lands included in any set-aside or diversion program should be rotated and sown in a soil-building legume crop to provide full-year protection. Cost-share funds should be provided to compensate farmers for timely planting of legume or warm season grass cover.

Senator **Fowler**. Mr. Nebel from—did I pronounce it right? Or Nebel?

Mr. **Nebel**. It is Nebel.

Senator **Fowler**. Nebel. With a name like Wyche I have learned to ask. [Laughter.]

Thank you, Mr. Nebel.

STATEMENT OF DOUG NEBEL, FARMER, EMERSON, NE

Mr. **Nebel**. Mr. Chairman, this is the first time I have testified here in Washington. I have testified before in my home State, but, I hope you can forgive me, I am going to have to read my testimony.

Senator **Fowler**. Senator Gorton is gone. You are forgiven. Just read it under 5 minutes.

INTRODUCTION

Mr. **Nebel**. Mr. Chairman and members of this committee, I thank you for the opportunity to appear before you to testify on soil conservation programs and compliance. Understand that I dug deep into my own pocket to pay for my trip out here because I believe it is important you hear my testimony.

CONCERN

Conservation of surface soil is a concept that is supported by a large segment of our society. As a farmer, I am apprehensive and skeptical because 99 percent of those in society and Congress have no idea for what it means to be a farmer and what that occupation entails. As chairman of a county committee, I have a real concern as to the quality and abilities of some of those employed in the Soil Conservation Service.

A PROBLEM WITH TERMINOLOGY

Being a farmer in northeast Nebraska means farming land that has been classified as so-called "highly erodible land" by the SCS. I have a problem accepting this terminology and in the methodology used in classifying procedures because the data that is used to determine surface soil conditions and conservation planning is 19 years old. The most recent soil survey in Dakota County was completed in 1971. The one previous was completed in 1919. Farming practices on family farms have changed dramatically the past 15 years. Farmers are using less tillage, less chemicals, less fertilizer in their farming practices today. Because of these changes, I contest the 49,000 acre number, in Dakota County, SCS claims to be "highly erodible" and still requiring treatment either through alternative cropping systems or by introducing a terrace system.

ADDED COSTS WITH ALTERNATIVE CROPPING SYSTEMS

Alternative cropping systems can mean spending tens of thousands of dollars to comply with SCS approved conservation practices. Many of these practices create economic hardship for farmers, especially for those producers who are required by their lending institutions to purchase crop insurance and guaranteed loans. Some approved practices also encourage increased chemical and fertilizer use. Many family farm operators will be forced off the land because they cannot absorb the added cost to their operation.

In my farming operation, it will cost me $50,000 to modify and purchase farming equipment needed to meet 100 percent compliance on SCS approved practices on my land. By practicing compliance programs, I am eligible for acceptance into the farm program and Federal crop insurance. Under projected deficiency payments, I gain $6 an acre by going into the farm program, versus staying out. Mr. Chairman, that $6 an acre will not even begin to pay the interest, much less the principal, on the money that I would have to borrow to purchase the farming equipment.

TERRACE SYSTEMS SHOULD BE A CONSERVATION COMPLIANCE METHOD OF LAST RESORT

Terrace systems should be a conservation compliance method of last resort. Federal cost assistance for this type of practice should be increased to 80 percent of the average county cost. Costs to the producer implementing this practice is $300 per treated field acre, after receiving the current 60 percent cost assistance. This program is not economically practical. Land sells for $700 per acre, at best, in the hill ground of northeast Nebraska, and Mr. Chairman, I just had my farm that I live on, the home place, evaluated before I came out here, and it was evaluated, appraised at $595 an acre.

CONGRESS MUST EMPOWER FARMER ELECTED COUNTY ASCS COMMITTEEMEN WITH A SIGNIFICANTLY LARGER ROLE IN CONSERVATION COMPLIANCE PROGRAMMING

Farmers are being asked to spend tens of thousands of dollars to practice soil conservation. At the same time, farmers have no representation in the formulating, planning and supervisory procedures in the determination of conservation practices and implementation. Congress must empower farmer elected county ASCS committeemen with a significantly larger role in conservation compliance programming. This will ensure that conservation practices are practical economically and practical in implementation.

CONCLUSION

Finally, but most importantly, commodity loan rates must be increased to at least 1985 levels and indexed up a certain percentage each year until reaching 100 percent of parity. This will allow family farm operations a continued existence and make it economically feasible to practice soil conservation. Remember, it is the family farm operations that have a genuine concern for the land, not the corporate/industrial farms.

I thank you, Mr. Chairman.

Senator **Fowler**. Thank you for your fine testimony, Mr. Nebel. Mr. Wetherbee.

[The prepared material submitted by Mr. Nebel follows:]

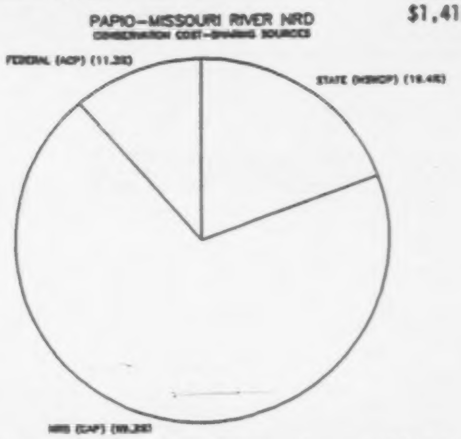
Agenda Item: 2.k.(5)

MEMORANDUM TO THE BOARD:

SUBJECT:	**CONSERVATION ASSISTANCE PROGRAM (CAP) UPDATE**
DATE:	**February 09, 1990**
BY:	**Ralph Puls, Land & Water Programs Coordinator**

Three sources of conservation cost-sharing funds are available to landowners in the Papio-Missouri River NRD. Those sources and the funding levels for F.Y. 1990 are:

FEDERAL	
Agricultural Conservation Program (ACP)	$ 160,000.00
STATE	
Nebraska Soil & Water Conservation Program (NSWCP)	274,000.00
PAPIO-MISSOURI RIVER NRD:	
Conservation Assistance Program (CAP)	978,000.00
	$1,412,000.00



The following chart, prepared from information supplied by the Soil Conservation Service, shows the status of conservation progress and needs for Highly Erodible Lands (H.E.L.) in the Papio-Missouri River NRD. It's apparent that at current funding levels, the programs shown here will not achieve the conservation treatment needed in the near future.

County	H.E.L. Acres	Acres Adequately Treated	%	Acres Requiring Treatment	Cost Share * Dollars Needed
Dakota	63,845	14,781	23	49,064	$4,415,760.
Thurston	98,724	16,860	17	81,864	7,367,760.
Burt	62,000	18,373	30	43,627	3,926,430.
Washington	132,392	31,084	24	101,308	9,117,720.
Douglas/Sarpy	115,813	62,864	54	52,949	4,765,410.
	472,774	143,962	30	328,812	$29,593,080.

* Based on a $150 per acre total cost and a 60% cost-sharing rate

Customer Purchase Order for John Deere Equipment

Q 75726

PURCHASER'S NAME & ADDRESS (First Signer)

NAME (first, middle initial, last): John Doe Farmer

(Second Line of Business Name)

STREET OR RFD

TOWN: Anywhere STATE: USA ZIP CODE

COUNTY CUSTOMER ACCT PHONE NUMBER

PURCHASER'S NAME & ADDRESS (Second Signer)

NAME

STREET OR RFD

TOWN STATE ZIP CODE

DATE OF ORDER	COMPANY UNIT	DEALER ORDER NO.	DEALER ACCOUNT NO.

CASH SALE ☐ TIME SALE ☐ | CSDC SEC. ○ RS NO. ○ EIN NO. | CUST. SALES TAX EXEMPT. NO.

SELLER'S NAME & ADDRESS

Logan Valley Impl
Cent Hiway 75
Wayne Neb

ADD CUSTOMER NAME TO MAIL LIST? ☐ Yes ☐ No

CONSUMER PRODUCTS: Homeowner ☐ H Commercial ☐ C Part-Time Farm ☐ F
AGRICULTURAL ☐ A
INDUSTRIAL C ☐ U ☐ F ☐ T ☐

I (We), the undersigned, hereby order from you the Equipment described below, to be delivered as shown below. This order is subject to your ability to obtain such Equipment from the manufacturer and you shall be under no liability if delivery of the Equipment is delayed or prevented due to labor disturbances, transportation difficulties, or for any reason beyond your control. The price shown below is subject to your receipt of the Equipment prior to any change in price by the manufacturer. It is also subject to any new or increased taxes imposed upon the sale of the Equipment after the date of this order.

QTY.		EQUIPMENT (Give Model, Size & Description) (Hours of Use)	PRODUCT IDENTIFICATION NO.	DELIVERED CASH PRICE	
1	1	Conversion kit for 7000 planter, 4 Row, Heavy duty drive spring			
		Conservation coulter, single blade 4 Row for rigid frame attachment, notched openers		3435	00
		freight		150	

I (We) offer to sell, transfer, and convey the following item(s) at or prior to the time of delivery of the above Equipment, as a "trade-in" to be applied against the cash price. Such item(s) shall be free and clear of all security agreements, liens, and encumbrances at the time of transfer to you. The following is a description and the price to be allowed for each item.

1. TOTAL CASH PRICE 3585 00

QTY.	DESCRIPTION OF TRADE-IN	PRODUCT IDENTIFICATION NO.	AMOUNT

2. TOTAL TRADE-IN ALLOWANCE		
3. BALANCE	3585	00
4. SALES TAX	143	00
5. SUB-TOTAL	3728	00
6. CASH WITH ORDER	—0—	
7. BALANCE DUE	3728	00

PURCHASER TYPE (Check One)

Private
- ☐ 1 Commerce
- ☐ 8 Household
- ☐ 9 Farm

Other
- ☐ 2 Federal Govt.
- ☐ 3 State/Province
- ☐ 4 Count.
- ☐ 5 City/Town/Village
- ☐ 6 Armed Forces
- ☐ 7 National Account

MARKET USE (Check One)

Agriculture
- ☐ 17 General Utility
- ☐ 13 Livestock Feeding
- ☐ 15 Row Crop Small Grain
- ☐ 16 Special Crop

Contractor
- ☐ 45 Bridges & Structures
- ☐ 41 Building
- ☐ 47 Demolition & Wrecking
- ☐ 46 Excavating
- ☐ 48 Highways & Streets
- ☐ 12 Land Improvement
- ☐ 35 Oil Field
- ☐ 50 Oil & Gas Pipeline
- ☐ 51 Paving (streets, parking lots)
- ☐ 43 Sewer & Water
- ☐ 52 Underground Utility

Forestry
- ☐ 21 Harvesting
- ☐ 24 Loading & Handling (woods, mills)
- ☐ 22 Reforestation, Site Preparation
- ☐ 23 Road Building & Maintenance

Mining & Quarrying
- ☐ 34 Coal
- ☐ 31 Metallic (Iron, Copper, etc.)
- ☐ 36 Stone, Sand & Gravel

Other
- ☐ 61 Manufacturing & Industrial Use
- ☐ 71 Airports
- ☐ 94 Golf Courses
- ☐ 92 Highway Mowing
- ☐ 95 Institutions (schools, churches, hospitals, etc.)
- ☐ 88 Material Handling (Retail and steel)
- ☐ 93 Nursery/Landscape
- ☐ 87 Parks & Cemeteries
- ☐ 74 Railroads
- ☐ 89 Residential
- ☐ 84 Sanitary, Landfill/Refuse
- ☐ 67 Scrap Handling

Rental & Lease Companies
- ☐ 97 Deere Dealer
- ☐ 98 Independent
- ☐ 99 Undefined Govt. Use

Utility Companies
- ☐ 82 Gas, Water & Electric
- ☐ 81 Telephone

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Purchaser's Signature ______________________ Accepted By ______________________

Purchaser's Signature ______________________ Date Accepted March 21 '84 Salesman

DELIVERY ACKNOWLEDGEMENT ▸	DELIVERED ON	WARRANTY BEGINS	SIGNATURE (INDUSTRIAL CUSTOMER, OTHER EQUIPMENT DEALER)

DC-1395

DEALER COPY

Customer Purchase Order for John Deere Equipment

R 96-24

PURCHASER'S NAME & ADDRESS (First Signer)

NAME (First, Middle Initial, Last): John Doe farmer
(SECOND LINE OF OWNER NAME):
STREET OR RFD:
TOWN: Anywhere
STATE: Neb
ZIP CODE:
COUNTY:
CUSTOMER ACCT:
PHONE NUMBER:

PURCHASER'S NAME & ADDRESS (Second Signer)

NAME:
STREET OR RFD:
TOWN:
STATE:
ZIP CODE:

DATE OF ORDER	COMPANY UNIT	DEALER ORDER NO	DEALER ACCOUNT NO

CASH SALE	TIME SALE	CBDC SEC ☐ IRS NO ☐ EIN NO	CUST. SALES TAX EXEMPT NO
☐	☐		

SELLER'S NAME & ADDRESS
Logan Valley Imp.
East Hiway 35
Wayne Neb.

ADD CUSTOMER NAME TO MAIL LIST? ☐ Yes ☐ No

CONSUMER PRODUCTS			AGRICULTURAL	INDUSTRIAL			
Homeowner	Commercial	Part-Time Farm		C	U	F	T
☐ H	☐ C	☐ F	☐ A	☐	☐	☐	☐

I (We), the undersigned, hereby order from you the Equipment described below, to be delivered as shown below. This order is subject to your ability to obtain such Equipment from the manufacturer and you shall be under no liability if delivery of the Equipment is delayed or prevented due to labor disturbances, transportation difficulties, or for any reason beyond your control. The price shown below is subject to your receipt of the Equipment prior to any change in price by the manufacturer. It is also subject to any new or increased taxes imposed upon the sale of the Equipment after the date of this order.

QTY	NEW	USED	DEMO	RENTAL	EQUIPMENT (Give Model, Size & Description) (Hours of Use)	PRODUCT IDENTIFICATION NO	DELIVERED CASH PRICE	
1	✓				750 John Deere drill, 15 ft, 24 x 7.5" spacing, grass seed attachment, seed tooth up, agr agitator, draw bar support		23494	00
					freight & setup		800	

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1. TOTAL CASH PRICE 24794

QTY	DESCRIPTION OF TRADE IN	PRODUCT IDENTIFICATION NO	AMOUNT

2. TOTAL TRADE-IN ALLOWANCE	- 0 -	
3. BALANCE	24794	00
4. SALES TAX	991	76
5. SUB-TOTAL	25785	76
6. CASH WITH ORDER	- 0 -	
7. BALANCE DUE	25785	76

optional Fert kit #1,49_ -

PURCHASER TYPE (Check One)
Private
- ☐ 1 Commercial
- ☐ 8 Household
- ☐ 9 Farm

Other
- ☐ 2 Federal Govt
- ☐ 3 State/Province
- ☐ 4 County
- ☐ 5 City/Town/Village
- ☐ 6 Armed Forces
- ☐ 7 National Account

MARKET USE (Check One)
Agriculture
- ☐ 17 General Utility
- ☐ 13 Livestock/Feedlot
- ☐ 15 Row Crop/Small Grain
- ☐ 16 Specialty Crop

Contractor
- ☐ 48 Bridges & Structures
- ☐ 41 Building
- ☐ 47 Demolition & Wrecking
- ☐ 46 Excavating
- ☐ 49 Highways & Streets
- ☐ 12 Land Improvement
- ☐ 35 Oil Field
- ☐ 50 Oil & Gas Pipeline
- ☐ 51 Paving (drives, parking lots)
- ☐ 43 Sewer & Water
- ☐ 52 Underground Utility

Forestry
- ☐ 21 Harvesting
- ☐ 24 Loading & Handling (woods, mills)
- ☐ 22 Reforestation, Site Preparation
- ☐ 23 Road Building & Maintenance

Mining & Quarrying
- ☐ 34 Coal
- ☐ 31 Metallic (Iron, Copper, etc.)
- ☐ 36 Stone, Sand & Gravel

Other
- ☐ 61 Manufacturing & Industrial Use
- ☐ 71 Airports
- ☐ 94 Golf Courses
- ☐ 92 Highway Mowing
- ☐ 95 Institutions (schools, churches, hospitals, etc.)
- ☐ 88 Material Handling (forklift and steer)
- ☐ 93 Nursery/Landscape
- ☐ 87 Parks & Cemeteries
- ☐ 74 Railroads
- ☐ 89 Residential
- ☐ 84 Sanitary Landfill/Refuse
- ☐ 67 Scrap Handling

Rental & Lease Companies
- ☐ 97 Deere Dealer
- ☐ 96 Independent
- ☐ 98 Undefined Govt. Use

Utility Companies
- ☐ 82 Gas, Water & Electric
- ☐ 81 Telephone

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Purchaser's Signature ______________ ______________
Accepted By ______________
Purchaser's Signature ______________ ______________
Date Accepted March 2 '95 Salesman Mick Topp

DELIVERY ACKNOWLEDGEMENT ▸	DELIVERED ON	WARRANTY BEGINS	SIGNATURE (INDUSTRIAL CUSTOMER OTHER EQUIPMENT DEALER)

DC-1080 [illegible] Printed in U.S.A.

DEALER COPY

Customer Purchase Order for John Deere Equipment

Q 757[illegible]7

PURCHASER'S NAME & ADDRESS (First Signer)
NAME (FIRST, MIDDLE INITIAL, LAST): John Doe Farmer
(BUSINESS NAME OF OWNER NAME)
STREET OR RFD
TOWN: Anywhere STATE: USA ZIP CODE
COUNTY CUSTOMER ACCT PHONE NUMBER

PURCHASER'S NAME & ADDRESS (Second Signer)
NAME
STREET OR RFD
TOWN STATE ZIP CODE

DATE OF ORDER	COMPANY UNIT	DEALER ORDER NO	DEALER ACCOUNT NO
CASH SALE ☐ TIME SALE ☐	CBOC SEC ○ IRS NO ○ EIN NO	CUST SALES TAX EXEMPT NO	

SELLER'S NAME & ADDRESS:
Logan Valley Impl
East Highway 26
Wayne Neb

ADD CUSTOMER NAME TO MAIL LIST? ☐ Yes ☐ No

CONSUMER PRODUCTS			AGRICULTURAL	INDUSTRIAL
Homeowner ☐ H	Commercial ☐ C	Part-Time Farm ☐ F	☐ A	C ☐ U ☐ F ☐ T ☐

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QTY	NEW	USED			EQUIPMENT (Give Model, Size & Description) (Hours of Use)	PRODUCT IDENTIFICATION NO	DELIVERED CASH PRICE	
1	✓				Max Till 4RW Cult, rear shanks, sweeps, guidleers, adj. hitches, shields, tilt, shields		6838	00
					Freight & Setup		440	
						1. TOTAL CASH PRICE	7278	00

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QTY	DESCRIPTION OF TRADE IN	PRODUCT IDENTIFICATION NO	AMOUNT	
		2. TOTAL TRADE-IN ALLOWANCE		
		3. BALANCE	7278	00
		4. SALES TAX	291	12
		5. SUB-TOTAL	7569	12
		6. CASH WITH ORDER	-0-	—
		7. BALANCE DUE	7569	12

PURCHASER TYPE (Check One)
Private
☐ 1 Commercial
☐ 8 Household
☐ 9 Farm
Other
☐ 2 Federal Gov't
☐ 3 State/Province
☐ 4 County
☐ 5 City/Town/Village
☐ 6 Armed Forces
☐ 7 National Account

MARKET USE (Check One)
Agriculture
☐ 17 General Utility
☐ 13 Livestock/Feeder
☐ 15 Row Crop/Small Gr.
☐ 16 Specialty Crop

Contractor
☐ 40 Bridges & Structures
☐ 41 Building
☐ 47 Demolition & Wrecking
☐ 48 Excavating
☐ 49 Highways & Streets
☐ 12 Land Improvement
☐ 35 Oil Field
☐ 50 Oil & Gas Pipeline
☐ 51 Paving (streets, parking lots)
☐ 43 Sewer & Water
☐ 52 Underground Utility

Forestry
☐ 21 Harvesting
☐ 24 Loading & Handling (wood, mills)
☐ 22 Reforestation, Site Preparation
☐ 23 Road Building & Maintenance

Mining & Quarrying
☐ 34 Coal
☐ 31 Metallic (Iron, Copper, etc.)
☐ 36 Stone, Sand & Gravel

Other
☐ 61 Manufacturing & Industrial Use
☐ 71 Airports
☐ 84 Golf Courses
☐ 92 Highway Mowing
☐ 95 Institutions (schools, churches, hospitals, etc.)
☐ 66 Material Handling (forklift and loader)
☐ 93 Nursery/Landscape
☐ 87 Parks & Cemeteries
☐ 74 Railroads
☐ 88 Residential
☐ 94 Sanitary Landfill/Refuse
☐ 67 Scrap Handling

Rental & Lease Companies
☐ 97 Deere Dealer
☐ 98 Independent
☐ 99 Unaffiliated Gov't

Utility Companies
82 Gas, Water & Electric
81 Telephone

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ACKNOWLEDGEMENTS

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Purchaser's Signature ______________________ Accepted By ______________________

Purchaser's Signature ______________________ Date Accepted March 21 '88 Salesman ______________________

DELIVERY ACKNOWLEDGEMENT ▶	DELIVERED ON	WARRANTY BEGINS	SIGNATURE (INDUSTRIAL CUSTOMER, OTHER EQUIPMENT DEALER)

DC-1285

DEALER COPY

Customer Purchase Order for John Deere Equipment

R 96425

PURCHASER'S NAME & ADDRESS (First Signer)

NAME (First, Middle Initial, Last): John Doe Farmer

(SECOND LINE OF OWNER NAME)

STREET OR RFD

TOWN: Anywhere STATE: USA ZIP CODE

COUNTY | CUSTOMER ACCT | PHONE NUMBER

PURCHASER'S NAME & ADDRESS (Second Signer)

NAME

STREET OR RFD

TOWN | STATE | ZIP CODE

DATE OF ORDER | COMPANY UNIT | DEALER ORDER NO | DEALER ACCOUNT NO

CASH SALE ☐ TIME SALE ☐ | CBUC SEC ○ IRS NO ○ EIN NO | CUST. SALES TAX EXEMPT NO

SELLER'S NAME & ADDRESS:
Logan Valley Impl
East Hway 35
Wayne Neb

ADD CUSTOMER NAME TO MAIL LIST? ☐ Yes ☐ No

CONSUMER PRODUCTS			AGRICULTURAL	INDUSTRIAL
Homeowner ☐ H	Commercial ☐ C	Part-Time Farm ☐ F	☐ A	C U F T ☐ ☐ ☐ ☐

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QTY		EQUIPMENT (Give Model, Size & Description) (Hours of Use)	PRODUCT IDENTIFICATION NO	DELIVERED CASH PRICE
1	✓	John Deere min till 4RW planter, HD min till arms, scrapers, insect and herbicide boxes, monitor, seed sensors, marker, chains, lights, & heavy duty down springs, ripple coulter with till shields, liquid fert. and double disk openers		15245.00
		freight - setup		650

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1. TOTAL CASH PRICE: 15895

QTY	DESCRIPTION OF TRADE IN	PRODUCT IDENTIFICATION NO	AMOUNT

2. TOTAL TRADE-IN ALLOWANCE	— · —
3. BALANCE	15895.00
4. SALES TAX	635.80
5. SUB-TOTAL	16530.80
6. CASH WITH ORDER	— · —
7. BALANCE DUE	16530.80

PURCHASER TYPE (Check One)
Private
- ☐ 1 Commercial
- ☐ 8 Household
- ☐ 9 Farm

Other
- ☐ 2 Federal Govt
- ☐ 3 State/Province
- ☐ 4 County
- ☐ 5 City/Town/Village
- ☐ 6 Armed Forces
- ☐ 7 National Account

MARKET USE (Check One)
Agriculture
- ☐ 17 General Utility
- ☐ 13 Livestock/Feedlot
- ☐ 15 Row Crop/Small Grain
- ☐ 16 Specialty Crop

Contractor
- ☐ 48 Bridges & Structures
- ☐ 41 Building
- ☐ 47 Demolition & Wrecking
- ☐ 46 Excavating
- ☐ 49 Highways & Streets
- ☐ 12 Land Improvement
- ☐ 35 Oil Field
- ☐ 50 Oil & Gas Pipeline
- ☐ 51 Paving (drives, parking lots)
- ☐ 43 Sewer & Water
- ☐ 52 Underground Utility

Forestry
- ☐ 21 Harvesting
- ☐ 24 Loading & Handling (woods, mills)
- ☐ 22 Reforestation, Site Preparation
- ☐ 23 Road Building & Maintenance

Mining & Quarrying
- ☐ 34 Coal
- ☐ 31 Metallic (Iron, Copper, etc.)
- ☐ 36 Stone, Sand & Gravel

Other
- ☐ 61 Manufacturing & Industrial Use
- ☐ 71 Airports
- ☐ 94 Golf Courses
- ☐ 92 Highway Mowing
- ☐ 95 Institutions (schools, churches, hospitals, etc.)
- ☐ 88 Material Handling (forklift, skid steer)
- ☐ 93 Nursery/Landscape
- ☐ 87 Parks & Cemeteries
- ☐ 74 Railroads
- ☐ 89 Residential
- ☐ 84 Sanitary Landfill/Refuse
- ☐ 67 Scrap Handling

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Purchaser's Signature ______________________ Accepted By ______________________ (Authorized Signature of Seller)

Purchaser's Signature ______________________ Date Accepted March 20 [illegible] Salesman [illegible]

DELIVERY ACKNOWLEDGEMENT ►	DELIVERED ON	WARRANTY BEGINS	SIGNATURE (INDUSTRIAL: CUSTOMER; OTHER EQUIPMENT: DEALER)

DC-1095 [illegible]

DEALER COPY

STATEMENT OF ROBERT WETHERBEE, PRESIDENT, NATIONAL ASSOCIATION OF CONSERVATION DISTRICTS, FAIRMOUNT, ND

INTRODUCTION

Mr. **Wetherbee**. Senator Fowler and members of the committee, as you indicated I am the president of the National Association of Conservation Districts (NACD), but I am not from Washington. I am a grain farmer from Fairmount, North Dakota, about 70 miles south of Fargo, North Dakota. That is where I make my living. This is a volunteer job.

I would like to thank the committee for the opportunity to testify on behalf of the 3,000 local conservation districts out there in America. Over the past 4 years, our member districts have worked side by side with SCS and the ASCS people helping to implement the Food Security Act that you passed in 1985. We have been involved in writing those conservation plans, and in making the highly erodible land determinations and in wetland determinations and have been very busy.

The conservation district officials, I think, have been on the front line in implementing the 1985 farm bill. I think it is with that background and firsthand experience, as a member of one of those local conservation districts that I appear today and offer some recommendations for issues to be included in the 1990 farm bill. My prepared testimony lists some detailed recommendations. I will just try to touch on a few of the high points of it.

THE CURRENT PROVISIONS ARE WORKING WELL, AND NACD WOULD RECOMMEND THAT THEY BE CONTINUED WITH ONLY MINOR ADJUSTMENTS

In general, I think the current provisions are working well, and NACD would recommend that they be continued with only minor adjustments. There are some things that are not perfect. Senator Conrad referred to some inequities in the payments for CRP. There is a great deal of confusion in swampbuster over what Congress intended when it tried to define a wetland. I think that needs to be clarified.

WE HAVE ACCOMPLISHED AN AWFUL LOT OF CONSERVATION

But on balance, we have accomplished an awful lot of conservation. We have written about 1.3 million conservation plans. We have talked to a lot of farmers that conservation districts never talked to before. We have changed conservation over to where it is a coffee shop topic in the farm bill today where it was not before. There is a great potential for major reduction in erosion, but I think the jury is still out. To some extent, we have written the plans, but we have only begun to implement them, and that is a major job. In doing so, we have tried to work cooperatively with farmers rather than beat them on the head. We have tried to explain the programs. And the vast majority of farmers have cooperated with that effort. We think they have cooperated primarily because we have attempted to work with them on education and technical assistance rather than beating them on the head with a stick.

IN IMPLEMENTING THE FOOD SECURITY ACT, CONSERVATION PROGRAMS HAVE PAID A PRICE

In implementing the Food Security Act, conservation programs have paid a price. Conservation districts have had to abandon a lot of other programs and problems that they have historically addressed out there because the Food Security Act consumed all of our work force, both on the Federal and on the local level. No one really anticipated how big a job it was going to be to write all these plans and contact all these farmers. We think that without some increase in appropriations for technical assistance we really do not see how we can implement the plans that we have written.

NATIONAL SURVEY OF CONSERVATION DISTRICTS

Our organization has just completed a national survey of the conservation districts of America and asked them what their workload looks like in the future. They tell us that they think they are short about 9,000 people to get the conservation provisions implemented and to address the other programs like rangeland conservation, flood control, forest land work that are also out there and should be priorities for them to do. We just want you to be aware of that problem when you start considering future additions to the workload for conservation districts out there.

RECOMMENDATIONS

In the line of the 1990 farm bill, we have provided detailed recommendations for addressing water quality, sustainable agriculture, and wetlands in the 1990 farm bill. We would urge you to consider new programs that continue to use education, technical assistance and cost-sharing as the basic premise on which to operate from. We think based on real world experience over a lot of years that that is the best way to get at it. Regulatory programs and threats or even any expansion of compliance at this point probably will not work. The farm community simply is not ready. The sociology, the economics are not ready to adopt that type of program, and we do not believe the technical agencies are ready to give us sound recommendations on what those programs should be, even if they were.

That is not to suggest that we do not start to clean up the Nation's water, but we should not require farmers to change production methods when we are not yet sure what the outcomes will be. I think we need more time to implement the compliance plans we have written under the Food Security Act. I think we need time to build closer bonds with producers and attempt to develop the higher level of trust with them.

I think there are some people out there that are advocating that source reduction is the solution to the water quality problems of this Nation, and I would not argue that that has a role. I think most progressive farmers today have already taken steps to reduce their chemical and fertilizer use. In fact, we heard Dr. Brown say as much. It is not the magic bullet to solve the problem though. It is only a part of it. We think that we should be placing more emphasis on what product you use and how you use it rather than on a simple percentage reduction of what you use.

We have to remember that no two farms are alike out there. On some farms that is easily done. You can reduce. In others you cannot. It takes a different prescription for each farm. I would urge you to be cautious about quick fix solutions. There is really no substitute for one-on-one work with the farms to get that job done.

CONCLUSION

In closing, I would like to thank you for your work with conservation districts and the agricultural community in drawing up some proposals for the 1990 farm bill. We appreciate working with you. We continue to see in the conservation district movement that the farmers are part of the solution, not just the problem, and we would like to continue to work with those farmers and with you to do something on that in the 1990 farm bill. Thank you.

Senator **Fowler**. Thank you, Mr. Wetherbee. And I thank you for your cooperation and help in our work together as well as your very fine suggestions.

[The prepared statement of Mr. Wetherbee follows:]

NACD

STATEMENT OF
THE NATIONAL ASSOCIATION OF CONSERVATION DISTRICTS
BEFORE
THE SUBCOMMITTEE ON CONSERVATION AND FORESTRY
SENATE COMMITTEE ON AGRICULTURE, NUTRITION AND FORESTRY
ON
CONSERVATION ISSUES FOR THE 1990 FARM BILL
MARCH 29, 1990

Mr. Chairman, members of the subcommittee, My name is Robert Wetherbee and I am president of the National Association of Conservation Districts. By profession I am a cash grain farmer from Minnesota. I am honored to be here today to discuss the conservation issues to be included in the 1990 Farm Bill. While it has been said before, I think it bears repeating that the 1985 Food Security Act was a landmark piece of legislation for conservation issues. It set the stage for the efforts to write the conservation title of the 1990 Farm Bill. We have accomplished a lot of conservation planning in the past five years. We know that all of the conservation provisions are not perfect, but on whole they are working well. Before we can decide about the final success of these programs, we are going to have to have time to fully implement the plans we have developed.

NACD has some specific recommendations for your subcommittee to consider. However, before I get into those I would like to take a moment to provide you with some general thoughts on conservation issues for the 1990s.

One of the things we learned from the 1985 FSA is you can't carry out an extensive conservation program unless you have a proper foundation in place. Conservation districts and USDA's Soil Conservation Service have been actively promoting soil erosion control more than 50 years. We worked hard to establish our credibility with the agriculture community and to show farmers that we understand their problems. Districts have been developing and approving resource management plans for many years. We have worked side-by-side with federal agencies developing conservation compliance plans. We have also proved that by combining federal state, and local resources and setting priorities at the local level, we can find solutions to land use problems that protect the economic viability of the land owner and protect the resource base.

You should be aware that succeeding at developing conservation compliance plans has had a very real cost to our resource base. We were faced with the choice of protecting farmers and keeping them eligible for federal farm program or continuing to provide technical assistance on a broad range of local priorities. We made the only choice we could at the time and provided assistance for conservation compliance. However, we were also forced to put other resource concerns on hold for almost five years. The litany of work undone is long. Rangeland improvement, forestry, water quality, wildlife enhancement, water conservation and urban conservation activities all had to be curtailed. My fear is that we are creating another national deficit, a natural resource deficit that will make the budget deficit pale by comparison. We have only accomplished the easy portion of conservation compliance to this point - the planning. We have at least half of the job left to get these plans implemented.

Our organization has just completed a national survey of conservation districts in order to estimate where we have fallen behind in addressing our resource conservation problems. The numbers are discouraging at best. If we take all of the field work force available for conservation activities, SCS, state, and conservation district, our members tell us that we need 40% more staff just to complete our work on conservation compliance. The numbers only get worse as we look at other resource areas. We are 43.5% short on staff to address non-FSA cropland erosion, 45% short for forest management, 46% short grazing lands, 55% short for water quality, 40% short for water conservation and wildlife, 48% short for urban conservation, and 52% short for conservation activities.

Looking at all of the resource activities shared by SCS and conservation districts, our districts have told us that we need 75% more staff in field offices. That translates into a need of over 9,000 additional federal, state and local field professionals. That doesn't take into consideration future changes in local requests or changes mandated by federal laws. If we tried to meet that need with only federal expenditures, we would be looking at increased costs of $270 million to $360 million annually.

Our ability to service farmers was certainly tested over the last five years of developing conservation compliance plans and will continually be tested in the future. We succeeded in getting the plans written because of our long-term experience in dealing with soil erosion and because we placed a priority on a single issue. We must be careful, however, in assuming that the compliance approach can also be successful in other resource areas.

I raise these points because it is important to remember our experience as we discuss what should be accomplished through the 1990 Farm Bill. There have been calls from several sectors to extend conservation compliance-like provisions to a number of other resource protection issues, particularly water quality. Before we do that, there are some questions that have to be answered. Do we have the technical expertise and breadth of experience to address these issues? Are there resources available, in the form of manpower and financial assistance, to help farmers meet new requirements? Finally, if we decide to target another priority resource concern, we must recognize the consequences to the resource base as a whole.

NACD believes that the wise tack to take at this time is to finish the conservation compliance job before we begin a new major effort in some other arena. It would be nice to be able to say "Now that soil conservation is addressed, let's take care of water quality." While that may be the choice of some "ivory tower" thinkers, the choices in the real world are much more complex. We cannot afford to set a national policy that addresses only one part of our natural resource base. The prudent choice is to approach our resources as a whole instead of piecemeal.

That means we are going to have to continue to gather the knowledge and experience necessary to attack these problems from solid ground. We need to continue to move forward with our research and education efforts. When we find answers to resource problems, let's attack them. However, let's not start new resource protection programs until we know for sure how to solve them. If we have questions remaining, let's answer them. Using this approach, I'm confident that land managers will respond.

At the same time, we cannot talk about resource protection in a vacuum. We have to recognize that when we develop federal policies that impact farmers, we do so in recognition of not only our goals for natural resource protection, but also individual profitability, national food policy, and export policy. Each of these, and other concerns, have to be woven into the fabric of a national farm policy. Natural resource protection is an important thread of this fabric, but it is not the only one. I believe that our past successes will continue only if we continue to respond to the needs of the people on the land. We have been able to do that by involving local citizens in the federal programs, utilizing their experiences and common sense. A program based on these virtues, experience and common sense, will have a far better chance of meeting our goals.

The last general point I must make concerns resources of another kind - the kind from the Appropriations Committee. I have made reference to this problem in a couple of earlier instances. I think that I should be more direct to ensure that there is no question about where NACD stands on this issue. We firmly believe that if we cannot afford to increase the field resources available to implement new program, then we have to question the value of these programs. The strain that conservation compliance has placed on the federal/state/local technical assistance partnership has been, and continues to be, tremendous. The truth is, without a significant increase in resources, we cannot take on any new program initiatives at this time. If we ignore this fact, any new effort is destined to fail.

I now want to pass on some specific recommendations for the 1990 Farm Bill developed by NACD's members.

EVALUATION OF 1985 CONSERVATION PROVISIONS

Conservation Reserve Program

The Conservation Reserve Program (CRP) was the centerpiece of the 1985 Food Security Act, enabling producers to remove highly erodible land from production for 10 years and to plant this land with conserving vegetation. The program has been highly successful, with an expected annual erosion reduction rate of 650 million tons of soil on the 34 million acres now under CRP contract. Two million acres have been planted to trees, and another 48,000 acres have been planted with filter strips to protect water quality.

We must strive, through the 1990 farm bill, to provide similar benefits to other environmentally sensitive areas and to consider the future of enrolled lands once current CRP contracts expire.

*NACD recommends that the current eligibility criteria be expanded to encompass lands which will contribute to water quality improvement, wildlife habitat preservation, wetlands conservation, endangered species protection and other environmental concerns.

*To meet these new environmental protection goals, NACD recommends that CRP be extended through 1995 and expanded beyond its current 45 million acre limit.

*NACD recommends providing increased incentives for tree planting on CRP lands by extending all tree contracts to 15 years, raising the cost-share rate for tree planting to 75 percent and increasing the time period in which the U.S. Department of Agriculture's Agricultural Stabilization and Conservation Service (ASCS) will cost-share weed control practices.

*CRP contract holders should be provided with protection for base acres once contracts expire, and offered options for keeping the land under vegetative cover.

Conservation Compliance

The 1985 Farm Bill's conservation compliance provisions required recipients of federal farm program benefits to develop an approved conservation plan for existing highly erodible farmlands by January 1, 1990. It appears that every farmer who requested a conservation plan had one developed by this deadline. But the real challenge lies ahead, as these plans must be fully implemented before January 1, 1995. Based on a recent district workload survey conducted by NACD, a 75 percent increase in resource specialists and technicians will be needed to assist farmers and ranchers in implementing their compliance plans by 1995.

*While NACD fully supports the use of alternative conservation systems (ACS's), it would be helpful for USDA to clarify the circumstances where they can be used in the future.

Sodbuster

The 1985 sodbuster provision attempts to protect the resource base by requiring a conservation plan for any new highly erodible lands being brought into agricultural production. Farmers who "sodbust" without an approved plan automatically lose eligibility for federal farm program benefits. Presently, penalties are the same regardless of whether a farmer sodbusts one-tenth of an acre or 10,000 acres. Current law also allows farmers to bring new highly erodible lands in to production while receiving rental payments for retiring other acres under CRP, sometimes placing the sodbuster and CRP provisions at cross-purposes.

*NACD recommends that the program be made fairer by allowing USDA to exercise flexibility in setting penalties equal to sodbuster violations. Further, NACD believes that this flexibility should apply to all 1985 conservation provisions.

*Sodbuster legislation should be changed so that farmers holding CRP contracts cannot also receive a sodbusting plan.

Swampbuster

Swampbuster, the wetlands protection provision of the 1985 farm bill, denies federal farm program benefits to producers who drain and plant an agricultural commodity on wetland areas. When the provision was adopted, it was assumed that its intent was to protect existing wetlands from conversion to agricultural uses. But a great deal of controversy has arisen regarding swampbuster's true intent.

*NACD urges Congress to clarify that the intent of swampbuster was to discourage the conversion of the nation's remaining wetlands, not to recapture previously converted wetland areas.

*NACD recommends that farmers be allowed to alter certain wetlands if they agree to mitigate the alteration by creating a wetland of the same size and function in another area.

RECOMMENDED INITIATIVES FOR 1990

Water Quality

The agricultural community recognizes that, if not properly managed, nutrients, sediment, animal waste and chemicals associated with agricultural practices can have a negative impact on local and regional water supplies. Over the past year, NACD has worked with the farm community to develop a practical strategy for protecting ground and surface waters from adverse impacts of agricultural practices. Specific legislative language for implementing the strategy has also been developed and is available from NACD.

NACD recommends that the water quality section of the 1990 conservation title include the following components:

*cooperation among federal, state and local governments, private industry and the nation's land owners and managers;

*accelerated research and reliable monitoring of the nation's water supplies in order to develop a better understanding of those agricultural practices which affect water quality and how such impacts can be mitigated;

*dissemination of water quality information through broad-based education and outreach efforts;

*a greatly expanded program of financial and technical assistance and other incentives to assist land managers in targeted watersheds in developing and implementing comprehensive water quality management plans; and

*reliance on state authorities to address situations where individuals fail to respond to incentives and where contamination poses an immediate threat to the public welfare.

Sustainable Agriculture

Conservation districts have always promoted agricultural practices that protect and improve our natural resource base. But a sustainable production system does not necessarily entail reduced chemical usage. Often, farmers may simply need to do a better job of managing these inputs.

*NACD supports expanded USDA research and education activities and demonstration projects in the field of sustainable agriculture.

*NACD urges Congress to evaluate the impacts that support payments, target prices and base requirements have had on the adoption of sustainable farming practices and to remove existing disincentives to the adoption of such practices.

Multi-Year Set-Asides

Annual changes in set-aside requirements have been one of the major impediments to installation of long-term conservation practices. The continually changing nature of set-asides has resulted in conservation farmers being penalized for protecting our resources. Farmers need the option of choosing multi-year set-asides without loss of program benefits. Use of multi-year set-asides will also be effective in improving wildlife habitat, enhancing wetlands protection and providing positive benefits to state water quality programs.

*While the 1985 Food Security Act authorizes the Secretary of Agriculture to institute multi-year set-asides for commodity programs, USDA has never used this authority. NACD recommends that the 1990 farm bill make this authority mandatory rather than discretionary.

Wetlands Restoration

The Conservation Reserve Program provides for protection of existing wetlands. However, if we are to meet the President's goal of no net loss of our wetland resources, we also need to restore previously converted wetlands to their original state.

*NACD recommends the development of an incentives program providing adequate financial return to farmers who restore wetlands.

*NACD recommends that the 1990 farm bill offer farmers the option of protecting wetland areas through permanent easement or rental agreements.

Great Plains Conservation Program

The Great Plains Conservation Program (GPCP) allows landowners in the erosion-prone Plains States to enter into long-term contracts with USDA, placing vulnerable land under a conservation plan. The program has contributed significantly to resource conservation efforts in the United States and is scheduled to expire on September 30, 1991.

*NACD supports a 10-year reauthorization of the GPCP, and recommends that Congress consider the issue in conjunction with the 1990 farm bill.

*NACD recommends raising the program's authorization by $300 million.

*NACD encourages the expanded use of windbreaks in conservation plans developed under the program and supports the expenditure of cost-share funds for windbreak establishment and renovation.

Thank you for this opportunity to share NACD's recommendations and I would be happy to answer any questions you may have.

Senator FOWLER. Mr. Frank Jones, chairman of the Special Committee on Environmental Issues of the National Cotton Council from the home of Buddy Holly.

STATEMENT OF FRANK B. JONES, CHAIRMAN, PRODUCER TASK FORCE ON ENVIRONMENTAL ISSUES, NATIONAL COTTON COUNCIL OF AMERICA, LUBBOCK, TX

Mr. JONES. Thank you.

INTRODUCTION

Mr. Chairman, I am Frank Jones, and I appear to be the lone cotton producer among a panel of grain farmers. I do farm highly erodible land on the Southern High Plains of Texas. This year I am serving as chairman of the National Cotton Council's Producer Task Force on Environmental Issues. Today I am speaking on behalf of the National Cotton Council, the National Association of Wheat Growers, the National Corn Growers Association, the American Soybean Association, and the U.S. Rice Producers Legislative Group. So I am speaking for several farm groups here today, Senator.

Senator FOWLER. Good.

Mr. JONES. On behalf of this group I would like to express our sincere appreciation for your hard work and your dedication to the development of credible agriculture and environmental policy. Your willingness to devote so much of your time to the very complex issues involved is highly commendable. We appreciate your staunch leadership in this area and look forward to continuing our working relationship with you and the rest of the members of the committee.

I will try to summarize my remarks and ask that my complete testimony be inserted for the record.

Senator FOWLER. It will be.

AMERICAN FARMERS HAVE ALWAYS BEEN GOOD STEWARDS OF THE LAND

Mr. JONES. Thank you. But first let me say that American farmers have always been good stewards of the land. Their concern for the environment is well established. They have always been concerned about environmental issues as well as the safety of the food supply. In fact, these farmers have shown themselves to be initiators and innovators when it comes to protecting natural resources.

The proposals which I will now outline runs the spectrum from fine-tuning the Conservation Reserve Program (CRP) to encouraging new research to improve resource management.

CRP

Under the Conservation Program, our proposal would keep the CRP minimum at 40 million acres and then give the Secretary of Agriculture the discretion to allow another 10 million into the CRP for environmentally sensitive as well as highly erodible land. When current contracts expire, farmers would have the option to rebid into the CRP for an extended contract of not less than 3, and up to 10 years and still have their base protected. After their contracts expire, producers may preserve their base history for not less than 5 years if they elect not to produce a crop on the land.

If CRP land is brought back into production after contract expiration, farmers should be expected to meet the same conservation standards as other highly erodible land which has been cropped and a reasonable period of time should be given to implement a conservation plan.

CONSERVATION COMPLIANCE

Under conservation compliance, the rules should remain in place with no change in the 1995 deadline. Offsetting compliance should not be required because it only penalizes farmers who must lease land. These farmers are now held responsible for the actions of their landlords or other tenants who may be out of compliance on other farms and this is not fair.

WETLANDS

Under wetlands, we would like to see the Secretary continue to institute voluntary programs for wetland protection. These should include a rental program for restoration or conservation of wetlands including long-term easements. Land which was planted, or considered planted, 6 years between 1975 and 1985 should be considered converted wetland. Producers should be allowed to convert existing wetlands only if they can adequately replace it by restoring a previously converted wetland and such mitigation would take place on a one-to-one ratio. The USDA would establish the minimum size of a wetland for de minimis determination. Any violation of wetland rules would be subject to a graduated penalty policy.

WATER QUALITY

Under water quality, our proposal would direct USDA to accelerate its efforts in discovering how agricultural practices may impact water quality and then identify which agricultural practices and inputs may result in degradation of water quality.

We believe that emphasis must be placed on education and research in preventing ground water contamination.

INTEGRATED CROP MANAGEMENT

Research and field testing technologies are important to the future of agriculture. Our coalition supports a systems approach to resource management, and we believe the integrated crop management (ICM) concept should be advanced with additional research and field testing. ICM looks at a broad range of management decisions that affect production and which make the farming practice more economically sound, as well as profitable. These include nutrient and pesticide management, which generally means more efficient use of inputs, rather than simply reduce use. Also, farmers who for the first time follow an integrated crop management system should be allowed to make adequate rotation of crops without losing their program base or payment yield.

ORGANIC TITLE

Our proposal is a result of many long hours spent in discussing alternatives in an attempt to take a balanced approach to environmental issues facing agriculture. We believe this balance is achieved in the programs which I have described. Furthermore, we are encouraged by Senator Fowler's efforts to include these proposals in a bill which he has drafted. He and his staff, along with several members of the Senate Agriculture Committee, have worked very hard in developing this legislation. We wholeheartedly give it our support.

CONCLUSION

In addition, we look forward to working with this committee as it continues its work on the 1990 farm bill. Thank you for inviting me today, Senator, and I am prepared to answer any questions.

Senator FOWLER. Thank you very much, Mr. Jones.

[The prepared statement of Mr. Jones follows:]

Testimony
Frank B. Jones, Chairman
Producer Task Force on Environmental Issues
National Cotton Council of America
Before the Subcommittee on Conservation and Forestry
of the Senate Agriculture Nutrition and Forestry Committee
March 29, 1990

Thank you Mr. Chairman.

Mr. Chairman my name is Frank Jones and I am the chairman of the National Cotton Council's Producer Task Force on Environmental Issues. Today I am speaking on behalf of the National Cotton Council, the National Association of Wheat Growers, the National Corn Growers Association, the American Soybean Association and the U.S. Rice Producers Legislative Group.

On behalf of this group, Senator Fowler, I would like to express our sincere appreciation for your hard work, and your dedication to the development of credible agricultural and environmental policy. Your willingness to devote so much of your time to the very complex issues involved is highly commendable. We appreciate your staunch leadership in this area and look forward to continuing our working relationship with you and the rest of the members on the Committee.

Furthermore, we appreciate the opportunity to testify today on a number of recommendations which we have for the conservation title of the next Farm Bill. But first let me say that American farmers have always been good stewards of the land. Their concern for the environment is well established.

They have always been concerned about environmental issues as well as the safety of the food supply. In fact these farmers have shown themselves to be initiators and innovators when it comes to protecting natural resources. Furthermore, the conservation programs in the 1985 Farm Bill have complemented and added to the success of these efforts to improve the environment and conserve the soil.

The 1985 Farm Bill has encouraged farmers to continue many progressive conservation measures. And most farmers have taken a very cooperative attitude toward the new conservation programs. For example, since the bill was written, farmers have developed conservation plans on 140 million acres of highly-erodible cropland that, when implemented, will reduce erosion by more than 1.4 billion tons per year. The Conservation Reserve Program is expected to reduce erosion by an estimated 655 million tons annually. And more than 2 million acres of trees and more than 7,000 acres of field windbreaks have been planted. Also, 49,000 acres of filter strips near water bodies have been created and about 2 million acres of wildlife habitat have been established.

We would like to build on the success of these programs and have come forward with proposals which will extend the favorable results of the 1985 Farm Bill and make existing programs more workable. Our proposal runs the spectrum from fine tuning the Conservation Reserve Program (CRP) to encouraging new research to improve resource management.

CONSERVATION RESERVE PROGRAM

Our proposal would keep the CRP minimum at 40 million acres and then give the Secretary of Agriculture the discretion to allow another 10 million into the CRP for environmentally sensitive as well as highly erodible land. For example, it would extend the criteria to include sinkholes, filter strips, windbreaks, shelterbelts, wetlands, aquifer re-charge areas, well-heads and areas that might involve groundwater protection as well as other environmentally sensitive areas. When current contracts expire, farmers would have the option to re-bid into the CRP for an extended contract of not less than 3, and up to 10 years and still have their base protected. If producers elect not to produce a crop on former CRP acres after their contracts expire and maintain the existing cover crop, the preservation of base history would be extended for a period of not less than 5 years. There would be a mandatory increased incentive for hardwood trees.

In a county where farmers experience extreme problems with conservation compliance or have difficulty in meeting other required environmental goals, the Secretary would have the authority to waive the 25 percent cap which is now in effect. Producers would also be able to designate as ARP acres land which was formerly under CRP contract. If CRP land is brought back into production after contract expiration, farmers should be expected to meet the same conservation standards as other highly erodible land which had been cropped and a reasonable period of time should be given to implement a conservation plan. The three year ownership rule should be waived for farmers on foreclosed land. And in situations where 85% of the farm qualifies for CRP then the rest of the farm should be allowed in the program.

CONSERVATION COMPLIANCE

Conservation compliance rules should remain in place with no change in the 1995 deadline. Offsetting Compliance should not be required because it only penalizes farmers who must lease land. These farmers are now held responsible for the actions of their landlords or other tenants who may be out of compliance on other farms and this is not fair.

WETLANDS

We would like to see the Secretary continue to institute voluntary programs for wetland protection. These should include a rental program for the restoration or conservation of wetlands such as an expanded water bank or longer term CRP contract. The purchase of long-term or permanent easements on existing wetlands should also be offered to producers. Land which was planted, or considered planted, six years between 1975 and 1985 should be considered converted wetland. Producers should be allowed to convert existing wetland only if they can adequately replace it by restoring a previously converted wetland and such mitigation would take place on a one to one ratio. The USDA would establish the minimum size of a wetland so that any wetland under the "de minimis" determination may be converted without adversely affecting the program eligibility of a farmer. Any violation of wetlands rules would be subject to a graduated penalty policy so that the penalty would be appropriate to the infraction.

WATER QUALITY

The quality of both ground and surface water is of paramount concern to farmers who live on the land and depend on a wholesome and stable supply of water. Their health and the health of their families depend on maintaining water supplies which are free from harmful contaminants. That is why farmers need to continue to evaluate their farming practices and adopt new technology, as it is developed, to ensure that their farming practices have a minimal effect on the environment. Our proposal would direct USDA to accelerate its efforts in discovering how agricultural practices may impact water quality and then identify which agricultural practices and inputs may result in degradation of water quality.

This would be a team effort. We would enlist the aid of the Cooperative Extension Service, the Soil Conservation Service, Agricultural Stabilization and Conservation Service, as well as local soil and water conservation districts. Part of the plan would be for the Cooperative Extension Service to develop and implement an educational program designed to increase the awareness of the agricultural community to potential impacts of farming practices on water quality. The Soil Conservation Service or the local soil and water conservation district would also play a role. They could design systems for protection of water quality. These new or refined technologies would then be made available to agricultural producers through conservation district offices. Additional funding would be appropriated for the SCS so that it can accelerate technical assistance in areas designated as potential sources of agricultural water pollutants, including nonpoint sources.

The Agricultural Stabilization and Conservation Service would develop a cost-share program to assist producers in implementing more costly water quality best management practice (BMP). The BMP would be developed by SCS or approved by the appropriate conservation district. USDA would also develop a cost share program with agricultural producers who wish to test the quality of the water in their wells. It would also be directed to utilize its field office system to assist other federal and state agencies and private citizens in identifying existing impacted areas and areas that have the potential for being impacted by agricultural pollution.

We believe that emphasis must be placed on education and research in preventing groundwater contamination. Furthermore, we are strongly opposed to any suggestion that producers be required to adopt government approved-input management plans.

INTEGRATED CROP MANAGEMENT

Research and field testing technologies are important to the future of agriculture. Our coalition supports a systems approach to resource management, and we believe the "Integrated Crop Management" (ICM) concept should be advanced with additional research and field testing. ICM looks at a broad range of management decisions that affect production and which make the farming practice more economically sound, as well as profitable. These include nutrient and pesticide management, which generally means more efficient use of inputs, rather than simply reduce use. We believe impediments to experimenting with alternative practices created by the commodity programs should be removed, and that a pilot program to test the viability of various new practices should be established. Also, farmers who for the first time follow an integrated crop management system should be allowed to make adequate rotation of crops without losing their program base or payment yield.

ORGANIC TITLE

As more organically produced farm commodities come on the market, some means of certifying them to consumers must be set up. Our plan establishes a USDA Commission to review federal and state organic certification programs. Criteria would include a three year abstinence from man-made inputs on land in order to qualify to be organically certified.

According to many reports and studies the decade of the 90's will be the environmental decade. The Conservation Title of the 1990 Farm Bill will be one of the forerunners for the development of more extensive federal environmental policy. We believe that it is important for farmers and agricultural groups to take an active role in developing this title. Our proposal is a result of many long hours spent in discussing alternatives in an attempt to take a balanced approach to environmental issues facing agriculture. We believe that this balance is achieved in the programs which I have described. Furthermore, we are encouraged by Senator Fowler's efforts to include these proposals in a bill which he has drafted. He and his staff, along with several members of the Senate Agriculture Committee, have worked very hard in developing this legislation. We wholeheartedly give it our support.

In addition, we look forward to working with this committee as it continues its work on the 1990 Farm Bill. Thank you for inviting me to testify and I am prepared to answer any questions which you may have today.

Senator FOWLER. Last, but not least, we have Mr. Layton Hoysler, the president of the American Society of Farm Managers and Rural Appraisers from Faribault, Minnesota. Mr. Hoysler.

STATEMENT OF LAYTON C. HOYSLER, PRESIDENT, AMERICAN SOCIETY OF FARM MANAGERS AND RURAL APPRAISERS, FARIBAULT, MN

Mr. HOYSLER. Thank you, Mr. Chairman.

INTRODUCTION

My name is Layton Hoysler, and I am president of the American Society of Farm Managers and Rural Appraisers. Our organization is headquartered in Denver, Colorado and represents some 4,000 professional farm and ranch managers, and rural real estate appraisers located in 46 States.

Senator FOWLER. You do not have any Final Four tickets on you, do you?

Mr. HOYSLER. We should have. We gave up a good position and lost it. So that would be interesting.

Senator FOWLER. I will be in Denver this weekend.

Mr. HOYSLER. And I will, too.

Senator FOWLER. So I will see you then.

Mr. HOYSLER. We have our council meeting there.

Senator FOWLER. Good.

Mr. HOYSLER. I appreciate the opportunity to testify before you today because we are very concerned about the conservation and environmental recommendations that go into the 1990 farm bill.

We recognize that these issues are very complex and we have dedicated a lot of hours and days to trying to help to formulate these programs, and we welcome your consideration because we think that this proposed legislation really meets a tremendous need.

Our organization and its members have long been working with farmers and for farmers, taking an active role in conserving land, and like most of our farmers and members of our organization we continue to come up with programs that we think are meaningful and helpful.

The conservation provisions of the 1985 farm bill and the practices that were implemented as a result of that have been undertaken, I think, very, very well by farmers, and have been environmentally progressive. So in short we think that farmers and members of our organizations are just as concerned and maybe more concerned about these resources and about the environment as any of the other groups that are showing their concern.

We have been working side by side with these major commodity groups trying to work out some things that we think will be adequate recommendations for this bill, and we think that we have developed a balanced and a very proactive approach to a broad range of conservation and environmental concerns.

OUR POSITION ON CRP

I would like to mention that we support the Conservation Reserve Program. We think that under that program we would like to recommend that the minimum be maintained at 40 million acres, and that the Secretary of Agriculture, however, be given some discretion in this and to enroll a possibility of an additional 10 million acres depending, of course, on environmental sensitivity and how much highly erodible land and land that gives us great concern needs to be brought into a program like this as compared to the concerns that have been expressed for good cropland that is not erodible is being brought into the program.

When current CRP contracts expire, we think that farmers should be given an option to rebid into the CRP for an extended contract of 3 to 10 years. We think that the base history, of course, in that should be protected. The preservation of that base history might be extended for as much as 5 years. But certainly it should not be given up because the farmer is cooperating in what is really needed from the protection of the soil.

The Secretary, we think, should be given authority to waive the current 25 percent cap in some counties. The reason for that is that some farmers are extremely, finding difficult problems on compliance and other environmental problems that they are encountering, and so the 25 percent cap should not necessarily be automatically a cutoff.

We think that the Secretary and the farmers who are allowed to designate this land should be able to take this CRP contract and maintain the cover and then declare it as part of the ARP program if it is appropriate in that instance.

We further recommend that farmers should be expected to meet the same conservation standards on CRP land that is brought back into production as the current highly erodible land. We feel that a reasonable time period, however, should be given to develop a good conservation plan if the farmer brings it out of the CRP.

Senator FOWLER. That is a good suggestion.

THE CONSERVATION COMPLIANCE

Mr. HOYSLER. In our opinion, the current rules for conservation compliance planning should continue and the 1995 deadline should not be changed. The same offsetting compliance rules should apply to landlords and tenants, and it should be fair and it should be equitable so that penalties that are levied would be commensurate with the degree of the noncompliance.

WETLANDS

On wetlands, we would like to suggest that the wetlands program, which is essential to the future of the nature, that the farmers be given a variety of options for their wetlands so that they can adequately protect them, among them to include a rental program or maybe a government purchase of long-term easements.

The purchase of permanent easements might be another option, and this would ensure existing wetlands be maintained and would not be converted. And at the same time the existing swampbuster regulations need to be made fair and workable for the producing farmers of our Nation, and we recommend in this what you have heard previously, I believe, that if any land is farmed 6 out of the last 10 years prior to 1985 that it would be exempt from swampbuster regulations. We think that that criteria is a sound one.

We recommend that farmers be allowed to convert an existing wetland only if it can be adequately replaced by restoring previously converted wetlands. So the mitigation could take place on a 1 acre per 1 acre basis. So we would not lose any ground or there would be no net loss as far as wetlands are concerned.

We recommend that the Secretary of Agriculture establish a minimum size under this de minimis standard so that a farmer who has a 2 acre spot that is costing him a lot of money would have an opportunity to improve that so that it does not cost more in field operations and all that type of thing.

We recommend for any violations that a graduated penalty program be implemented so that the so-called penalty would fit the crime.

WATER QUALITY

In water quality we feel that farmers are especially concerned because their families and our families, just as yours, depends on a healthy stable supply of water. The goal that we recommend, then, in this regard is that additional research be conducted on what happens with these agricultural practices and just what is the impact on water quality, including anything having to do with pesticides and nutrients. As farmers, we constantly seek new technology to improve these practices.

We also recommend that technical, financial and educational assistance be provided to farmers to implement what we would call best management practices. And of course, that is with the aid of the Cooperative Extension Service, the Soil Conservation Service, and the Agricultural Stabilization and Conservation Service (ASCS).

And we finally recommend on water that we develop a cost-share program so that we could truly go out and test the wells and find out where the problems are, if any.

INTEGRATED CROP MANAGEMENT

We also support the integrated crop management concept that has been proposed, and we feel that this will maximize the opportunity for farmers to maintain their bases and will qualify for the yield payments and the other incentives that are part of this program.

CONCLUSION

In closing, Mr. Chairman, I would say that almost every Senator and Representative who we have talked to and who have appeared before our farm groups in the past 2 years has given us one uniform message: farmers must develop some environmental proposals that can be supported by the Congress. Mr. Chairman, I believe we have done that.

We think that these recommendations, as outlined, have been a good faith effort on our part to meet the challenge the Congress, to challenge ourselves, to bring our members into the forefront of having two things happen.

One, maintain some economic viability, and two, at the same time take a major step toward enhancing our environment. We understand that the introduction of your bill is imminent. We are pleased that it will be proposed soon, and we certainly thank you for your sponsorship and for all the assistance that we have had in helping to develop this kind of a proposal.

We thank you for your time.

[The prepared statement of Mr. Hoysler follows:]

TESTIMONY
LAYTON C. HOYSLER
PRESIDENT
AMERICAN SOCIETY OF FARM MANAGERS AND RURAL APPRAISERS
CONSERVATION AND FORESTRY SUBCOMMITTEE
SENATE COMMITTEE ON AGRICULTURE, NUTRITION AND FORESTRY
MARCH 29, 1990

Mr. Chairman, my name is Layton Hoysler, and I am President of the American Society of Farm Managers and Rural Appraisers. Our organization is headquartered in Denver, Colorado and represents some 4,000 professional farm and ranch managers and rural real estate appraisers located in 46 states. I appreciate the opportunity to testify before you today on conservation and environmental recommendations for the 1990 Farm Bill.

Our organization and its members believe it is important for farmers to take an active role in conserving the land, and like most other farmers, our members have and will continue to work to improve the environment and conserve the soil. Conservation provisions of the 1985 Farm Bill and many practices undertaken freely by farmers have combined to make U.S. agriculture, as a whole, environmentally progressive. In short, our farmers are environmentalists, and the so-called "environmental groups" are not alone in their concern for our natural resources.

For many months, we have been working along side the major commodity groups and other farm organizations, some who have just testified, on recommendations for the 1990 Farm Bill. We feel we have developed a balanced and pro-active approach to a broad range of conservation and environmental issues, and the members of our organization fully support these positions. I would like to take this opportunity to briefly outline some of our positions.

CONSERVATION RESERVE PROGRAM

Under the Conservation Reserve Program, we recommend:

(1) The Conservation Reserve Program (CRP) minimum be maintained at 40 million acres and the Secretary of Agriculture be allowed, at his discretion, to enroll another 10 million acres in the CRP to include environmentally sensitive and highly erodible land. CRP sign-up should be extended through 1995.

(2) When current CRP contracts expire, farmers be given an option to re-bid into the CRP for an extended contract of three to ten years but still have their base history protected. Preservation of a farmer's base history would be extended for not less than five years if he elects not to produce a crop on former CRP acres and maintains the existing cover crop.

(3) The Secretary be given authority to waive the current 25 percent cap in counties where farmers experience extreme problems with conservation compliance or other environmental problems.

(4) Farmers be allowed to designate land which was formerly under CRP contract as ARP acres if the cover has been maintained.

(5) Farmers would be expected to meet the same conservation standards on CRP land brought back into production as current highly erodible land. A reasonable time period should be given to develop and implement a conservation plan.

CONSERVATION COMPLIANCE

Current rules for conservation compliance planning should continue and the 1995 deadline should not be changed. The same offsetting compliance rules should apply to landlords and tenants and should be fair and equitable so that any penalties levied would be commensurate with the degree of non-compliance.

WETLANDS

In order for wetlands protection programs to be successful, as we would all like for them to be, it is essential that these programs remain voluntary. Under our recommendations, farmers would be given a variety of options for protecting wetlands, including a rental program, government purchase of long-term easements and purchase of permanent easements on existing wetlands to ensure against conversion. At the same time, existing swampbuster regulations need to be made fair and more workable in the real world of today's agriculture. In order to accomplish this, we recommend:

(1) Land farmed for six out of ten years prior to 1985 would be exempt from swampbuster regulations.

(2) Farmers would be allowed to convert an existing wetland only if it can be adequately replaced by restoring previously converted wetlands. Such mitigation would take place on a one to one ratio which would guarantee a "no net loss" of wetlands.

(3) Secretary of Agriculture would establish the minimum size of a wetland so that any wetland under the "de minimus" standard may be converted without adversely affecting the program eligibility of a farmer.

(4) For any violation of wetlands rules, a graduated penalty program be implemented so that the penalty fits the crime.

WATER QUALITY

The quality of our water is of vital importance to all of us, including farmers. My family and yours depend on a healthy and stable supply of water which is free from harmful contaminants. This goal can be achieved only through a team effort. We recommend:

(1) Additional research be conducted on how agricultural practices may impact water quality, including the application of pesticides and nutrients. As farmers, we must continue to seek improved technology in our farming practices.

(2) Technical, financial and educational assistance be provided to farmers to assist in implementing "best management practices" with the aid of the Cooperative Extension Service, the Soil Conservation Service and the Agricultural Stabilization and Conservation Service.

(3) USDA develop a cost-share program to assist farmers who wish to test the quality of the water in their wells.

INTEGRATED CROP MANAGEMENT

Our organization supports an Integrated Crop Management concept which would include additional research and field testing on environmental production systems, including best management practices, integrated pest management and sustainable agriculture pilot programs. Crop base acreages and payment yields would be protected for a period of time to give farmers an incentive to test an integrated crop management system. All programs and practices included under an ICM concept must be carefully tested and evaluated. We must prove that these practices are environmentally sound as well as economically feasible.

In closing, Mr. Chairman, let me say that almost every Senator and Representative who has appeared before a farm group during the past two years has had one uniform message -- farmers must develop some environmental proposals that can be supported by the Congress. Mr. Chairman, I believe we have done that. These recommendations I have outlined represent a good faith effort on our part to meet the challenge laid out by you and other Members to develop progressive new programs that will allow agriculture to maintain economic viability and, at the same time, take a major step forward in enhancing our environment.

Senator **Fowler**. Thank you, Mr. Hoysler, and all five of you, for the specificity of your testimony and your suggestions, and I have held off on the final introduction just to get this hearing in and to make sure that we have the last minute suggestions and help on improvement. And I am glad I did. I have already heard several suggestions that I want to take a look at. To Mr. Jones, speaking on behalf of all the, as you said, all the commodity groups, I want to thank you for your leadership, and that of those who you represent, along with Mr. Wetherbee, for addressing, helping me address these very, very tough questions of balancing our health concerns, environmental concerns, with extraordinary success of production agriculture in our country over the last years, and you have been a tremendous help as we begin, get to this stage of the process, get to the tough questions at the markup level.

There are a lot of questions that I would like to ask you. It might be best especially including our farmers here from Nebraska, to begin with you, Mr. Jones, but then I want to ask, I want anybody who has an opinion on this to volunteer, and that is in the farm community, whether you are working farmers now or those of you who represent the various stages of agriculture, looking back, we seldom do look back around here—that is one of the problems of the Congress or any policymakers—but looking back, what would you identify as the single biggest problem that you encountered under the 1985 farm bill?

Mr. **Jones**. Well, Senator, in my specific case—of course, I am talking about the conservation provision.

Senator **Fowler**. Of course, I am talking about the conservation provision.

Mr. **Jones**. Right.

Senator **Fowler**. Let us not get into that——

Mr. **Jones**. OK. That is exactly where I was headed. As I said earlier, I do farm highly erodible land on the Southern High Plains of Texas, and in my specific case, the thing that I have had to work on since the 1985 legislation was developing or looking forward to 1990 to have my conservation plan in place and ready to go and have a conservation plan that would meet the requirements of the legislation and yet still be something that as a producer I could live with and was economically sound in my particular operation.

Senator **Fowler**. Anybody else? Mr. Warrick.

Mr. **Warrick**. Yes, Senator. I would say that I was originally very concerned when they introduced—I remember when Wilson Scaling did it—head of the SCS—alternative management practices under the compliance section and removed (T) as a soil conservation goal under the planning process. I feel very strongly about that—our coalition does—that we should have goals out there for farmers to achieve. If those goals are difficult to meet, and I think Doug expressed very plainly that it is difficult sometimes to meet those goals, then I think there is no reason why under certain exemptions that you could not extend the time for final implementation of that planning process.

But I still think you should have the goal of a certain soil conservation standard out there that farmers can hopefully reach for. Under swampbuster, I was extremely concerned that farmers could continue to drain wetlands, but not raise a commodity program under it, and still receive payments or benefits. I feel that drainage should be the violation and not the raising of commodity programs. Under the CRP, I was concerned again that most of the land went into the Western High Plains area. It is well-known that many producers out there just wait for a soil bank or a CRP to come along so they can enroll their lands back in those programs. We think that the future focus of the CRP should be in the higher rainfall, highly erodible areas where ground water is a problem and surface water pollution is a problem.

I realize that the payment limitation in those areas were low, but I think this is where future CRP expansion should be targeted; also, in water quality areas around sink holes. So those three concerns were major. And I do not think we intended to let those be applied when we sat down and wrote the 1985 farm bill, but in a rulemaking process, we feel that it was weakened significantly because of that.

Senator FOWLER. Well, in your area is there land being farmed today that should be set aside or protected?

Mr. WARRICK. Yes, there is. There is a large amount of land that could still be expanded into the CRP acres. And I am thinking primarily of field windbreaks, grass contour strips that we could expand, and also the administration's tree programs. The Great Plains historically have needed trees planted out there. I realize in some areas of the Great Plains trees do not grow well. But I think as you get into the eastern sections of the Corn Belt that some of that highly erodible land can grow trees very well, especially in Senator Grassley's area, in the highly erodible lands. It is kind of a catch-22. It is highly productive land. But it is also highly erodible, and this has always been a major problem as I see under the compliance section.

How do you get conservation on highly erodible land but highly productive land without removing the farmers from the land? I mean you have a real nut to crack, and I think Doug expressed it very well because he lives in that area.

Senator GRASSLEY. One word. Cattle.

Mr. WARRICK. Well, I hope you can deal with the Cattlemen's Association sometimes better than I can because it is tough. But you are right. Livestock and diversified farming is the answer. I think we specialize too much in agriculture, and I would like to see more diversified agriculture, and I think, Senator Fowler, your original bill, S. 970, really focused on it, especially your preamble on that that diversified agriculture is so important in the United States.

Senator FOWLER. Thank you. Mr. Nebel, you continue on.

Mr. NEBEL. Well, I think——

Senator FOWLER. The Nebraska farmer—well, go ahead. Go ahead and say what you want.

Mr. NEBEL. I would like to respond on that a little bit. I would like to change the word "cattle," though, Senator Grassley, to "practicality." I think that is a single word that best sums up the problem with the 1985 farm bill. It is not practical to continue to lower target and loan rates and expect the farmer to spend tens of thousands of dollars to try to be in compliance. And also, a lot of the plans that we have in our county that we are being asked to use and to implement simply are not practical to implement.

Senator Fowler. What about integrated pest management?

Mr. Nebel. Pardon?

Senator Fowler. What about pest management? What about integrated pest management or low-input management practices? Do you have farmers who want to do that and are not doing that, and if so, why not, and what would it take to encourage them? Or what impediments are there in the law that would keep them from doing it now?

Mr. Nebel. I do not think—you are talking about the LISA concept now? I do not think that LISA is going to be compatible with the plans that we have that we are allowed to use in Dakota County.

Senator Fowler. Why?

Mr. Nebel. Because the LISA concept, such as weed control, requires mechanical tillage versus chemical control, many of these weed seeds, it has been proven by agronomists, can lay in the ground for up to 80 to 100 years. And they will not grow until the right soil conditions occur. Some of them are harder seed than others, and they are in the ground, they are under the soil surface, and if you have minimum tillage, you are going to have to use more chemical. Right now I banned chemical on my crops. I have cut fertilizer and chemical use in half, and I am going to go back and expand that. I am going to put on more fertilizer if I have to put that nitrogen on top of the ground.

Senator Fowler. What has that done to your production?

Mr. Nebel. Cutting it back? My production has remained constant, and that is where I have a problem, too, on the amount of soil lost and being classified as highly erodible land because my production is staying constant, and at the same time I am cutting back on the amount of fertilizer I am applying to that land. If I am losing that much soil, I should have, common sense would tell me that I should have to put more fertilizer out there to keep a constant level of production. And I am not having to do that. I have been able to build up that soil and I have been able to start cutting back on chemical and fertilizer use now.

But I will not be able to use the LISA concept if I do not have conservation plans that I can live with, that are practical economically. That is what we need. You know I am for conservation compliance. Most of the farmers in my area are, and I am speaking also as chairman of the Dakota County ASCS committee and as a board member of the Nebraska League of Rural Voters, too. But practicality is a key word, and we need to have an increase in the target and the loan rates. We need to have farmers, farmer-elected county committee men play a major role in each county to have a local say in what type of plans that we can use.

And if we have that, then I think you will see the LISA concept practiced more, and I will be willing to use the LISA concept if I can have conservation plans that are compatible with low-input sustainable agriculture. I think there are two key words in those four words, too, and that is "sustainable agriculture." First, we have to have sustainable agriculture before we can have low-input sustainable agriculture, and I do not believe with low target prices and ever increasing lower loan rates that we have sustainable agriculture today. Thank you.

Senator **Fowler**. Yes, Mr. Jones.

Mr. **Jones**. Senator Fowler, I would like to speak to the CRP issue that Mr. Warrick raised earlier, and it seems that in his opinion that on the Western Plains people just wait for such as soil bank and CRP, and I can assure you in our areas out there, our income is much greater from production than it is relying on Federal programs. Some of the problems we have are artificially placed on us such as payment limitations and a conservation compliance program that starts talking about (T) values in the early stages of the game, and it is very apparent to us in our area that we cannot meet (T) values specifically. So consequently, many acres went into the CRP in that area because it was apparent that until the alternative methods were introduced there was no way to meet (T) values in addition to the payment limitations which are artificially imposed on top of the economics of production. So that is why many acres in our area went into the CRP.

Another thing I would like to speak to is on this integrated crop management idea, I have heard—in fact, Mr. Brown earlier today—talking about indiscriminate use of fertilizers and pesticides, and I can assure you that from a production agriculture standpoint we do not use these indiscriminately because they cost money. If they do not increase your production or protect your crop, you do not go spraying just indiscriminately. And what we as producers, or certainly cotton producers, we are looking at soil samples to be able to cut back on the amount of insecticides or fertilizers it takes to maintain our production level, and as far as pesticides are concerned, we have consultants that give you the threshold level, and there is not an 8 day spraying schedule per se anymore. It is on a need basis. When the pressure, the insect pressure, meets the economic threshold, and I think these are areas that need to be emphasized as far as environment is concerned because producers are making progress in these areas. Thank you.

Senator **Fowler**. Mr. Wetherbee.

Mr. **Wetherbee**. Senator, the question as to the single-most important issue of concern, I think, to our members in the National Association of Conservation Districts, would probably be the fact that although we strongly supported the Food Security Act of 1985, we have seen a terrible lack of resources and funds to take care of other natural resource problems because we have put everything we had into the Food Security Act. And that is a real concern. There are a lot of natural resource problems that are interrelated, and when you just strictly look at one, soil erosion, you neglect some of the others, and we think that needs careful consideration in the future.

If you looked at individual programs, I would suspect that our people would tell you that the lack of a graduated penalty for any of the provisions of it, and the constantly changing definition of what a wetland is, almost a moving target, trying to figure out what it is, are major problems.

Senator **Fowler**. Mr. Grassley.

Senator **Grassley**. I do not think I have any questions, Mr. Chairman.

Senator **Fowler**. Mr. Warrick. Thank you.

Mr. **Warrick**. I would just like to second what Mr. Wetherbee said. He mentioned payments and I neglected to say that cost-share payments for conservation. It is very frustrating, I think, to farmers that are working under the compliance section. When they go to the local ASCS office, and they find their cost-share money has disappeared, sometimes within a month of it being allocated, and here they are working under deadlines and there is no cost-share money, and I think the benefits do accrue many times off the farm. And if there is anything I could encourage as to certainly if you cannot increase the cost-share, why keep it available to farmers so that they can have that money to work with.

Mr. **Hoysler**. Mr. Chairman.

Senator **Fowler**. Mr. Hoysler.

Mr. **Hoysler**. I would make one comment. You asked the question about what seems to be the greatest concern to the people that we deal with, and I think that greatest concern is expressed in the word "flexibility." It seems that on occasion something that is so logical, so likely and should happen, cannot happen because there is no flexibility. And I will give you an example. This is a personal one. Some years ago I had an approximate 2 acre wetland in a high location on my farm, and the problem was that that always remained wet. It was never wet enough to have any water in it, but it remained so that it could not be farmed. So it cost me hundreds of dollars over a period of years to farm around this little spot. At the same time, I had 25 acres of true wetlands and wildlife area on this same property.

I chose to run an underground tile line to that 2 acre spot. The result was that when we would have a 1 inch or a 1½ or 2 inch rain, that water would soak down and would not cause a problem. Previously, because it was already wet, that water reached the Mississippi River probably in a matter of a few hours or certainly in a matter of a day or so. After the tile was installed to that minor spot, we never had any trouble with erosion because the rush of water soaked in instead of creating a problem by having to run off over the surface to a natural drainage area. And what I am saying is that a flexibility of an extremely small area that could be put into production in exchange for an acre or 2 acres or whatever it is in a more likely location would give that flexibility. I think it is something that I hear more from the people that I talk to as a problem. They need a little more flexibility, and they would probably dedicate more than an acre for an acre just to have that inconvenience and that economic problem removed. So I think that is the thing I have heard more than anything else that is out of the 1985 farm bill.

Senator **Fowler**. Well, we are trying hard is all I can say in reassurance. It is hard to define flexibility. It is hard to define practicality, Mr. Nebel. I spent 10 years in the House of Representatives on the Tax Committee, and I learned then how hard it is to design a Tax Code that fits all 248 million Americans, all different size families, all different businesses, from mom and pop operations to big corporations, who should get incentives, and who should not, who should get deductions and who should not, who should get credits. Very, very difficult. All of you have been very helpful to us and the committee in trying to look at these problems and make at least a small step toward progress, again, of balancing these concerns. But I want you to know from me anyway that we are going to continue to work to give more flexibility where it will help us in our conservation efforts and to use more practicality on behalf of the farmers who we are relying on for all that, this stewardship.

But it is not an easy task. Your suggestions, all of yours, uniformly both in your testimony and all of you, as I said, have been very specific in areas that will continue to be worked into mine and Senator Dole's proposal as we move forward in late April on this conservation title. And if I need any more specific information to back up your suggestions, I will pick up the phone and call you. Thank you very much.

Mr. **Warrick**. Thank you.

Mr. **Nebel**. Thank you, Senator.

Mr. **Hoysler**. Thank you.

Senator **Fowler**. Our last panel, Mr. John Turner, the Director of the Fish and Wildlife Service; Mr. Marion Berry, a rice and soybeans farmer from Gillett, Arkansas; Mr. Peter Berle of the Audubon Society; Mr. Todd Herreid, Sierra Club; and Ms. Cindy Deacon Williams, Wildlife Federation. Thank you, ladies and gentlemen.

Mr. **Turner**. Good afternoon, Senator.

Senator **Fowler**. Good afternoon, Brother Turner. We will begin with Mr. John Turner, the Director of the U.S. Fish and Wildlife Service, Washington. I will ask you later whether you are cooperating and vice versa.

Mr. **Turner**. All right.

STATEMENT OF JOHN F. TURNER, DIRECTOR, U.S. FISH AND WILDLIFE SERVICE, DEPARTMENT OF THE INTERIOR, WASHINGTON, DC

Mr. **Turner**. Mr. Chairman, it is a pleasure for me to appear before your subcommittee in consideration of the Food Security Act as Director of the Fish and Wildlife Service.

I appear before you as a new administrator in the Federal system with a background in wildlife but also a third generation rancher from the State of Wyoming and two decades in the Wyoming Legislature. I was surprised to have my staff tell me today that this is only the second time that the Fish and Wildlife Service has indeed appeared before this committee.

I am pleased to be here because I think this discussion provides us with an opportunity to build positive partnerships with our ranchers and farmers around the country. I personally believe that it is essential for the long-term well-being of the resources entrusted to us, the great wildlife and fisheries resources of this country. And second, I think we can build some enhanced tools to meet the very laudable and attainable no net loss of wetland goals for this country.

WETLAND RESTORATION PROGRAM

Just briefly, Mr. Chairman, I would like to first discuss and support what I see as a wetland restoration program in consideration for your committee; and second, comment on some specifics of how this might work; and third, just to talk a little bit about the experience in wetlands restoration that the Fish and Wildlife Service, we hope, brings to the topic.

IN RESTORATION, WE THINK WE HAVE CONSIDERABLE RESEARCH CAPACITY

First of all, in restoration, we think we have considerable research capacity. We have thousands of biologists across this country who are dedicated and committed with extensive experience in cooperation with landowners and other governmental agriculture entities in restoring wetlands. In the last 3 years, the Fish and Wildlife Service has restored 55,000 acres of wetlands under the farm bill programs. It is our goal for 1990 and 1991, under current resources and authorization, to try to restore up to 45,000 acres of wetlands each year under the Farmers Home program, CRP, and other private land initiatives.

The projects that we have adopted in those 55,000 acres, most of those sites are small, include some 3,100 sites. So you can see they are mostly small in nature. They are inexpensive, relatively easy, about $150 per acre restoration costs. The values have been very high, and the recovery has been rather quick. In looking at tracts of land that would go in the reserve, we strongly support long-term easements, perhaps even in perpetuity. We feel this gives better equity to the taxpayer since we are going to put out amounts that come close to purchase price, plus we are going to put out amounts to restore the wetlands, and since we are talking about limited resources and acreage in an expanded reserve, we think that our money and cost benefit will be best in the long-term, and we, of course, are talking about a depleted resource that we are going to try to protect for the long-term.

WHAT KIND OF LANDS WOULD WE PUT IN THE RESERVE AND WHO WOULD SELECT THEM?

What kind of lands would we put in the reserve and who would select them? I would say they would be restorable crop wetlands and necessary buffer areas with high wildlife and other biological values. They would be selected jointly by the Soil Conservation Service and the Fish and Wildlife Service. Second, as I mentioned, I think they should be long-term, and we think that the landowners of this country would respond positively. We have had that kind of experience in the purchase of easements in our duck stamp program where we have acquired over 1 million acres, especially in the Dakotas and the Minnesota area. The restoration plans for these wetlands would be done jointly by the SCS with their engineering background and knowledge of farm operations, and our people with our biological values.

One important thing that I think we should allow on these easements is economic uses by the landowner. I think that would be a key. Allow them to graze the land, timber it, recreation, hunting and fishing, as long as it does not impact the purpose for which the wetland was applied. And of course, the landowner will continue to control public access to the wetland. The funding would be mostly through the Department of Agriculture.

Senator FOWLER. In other words, do anything but crop it?

Mr. TURNER. I think that—I know in my own State, there are some haying activities on existing wetlands, in fact, that would enhance waterfowl values. So I think that cropping could be considered, but it would have to be dependent on what you paid, the price you paid for it, and what the purpose of the wetland is. And I guess what you said earlier is flexibility and common sense when you set these up. But if the taxpayer pays for——

Senator FOWLER. Well, let us leave that argument aside for a minute. What I am trying to decide is what you include if you are going to have a long-term conservation easement, the idea being to preserve the wetland as a wetland for all of the values of wetlands including water purification and recycling. And you say you want to use it for economic activities. I want to know how you would define your economic activity.

Mr. TURNER. What I was trying to get at, Mr. Chairman, was to allow the landowner some uses of that land that would be another positive incentive to him. Renting out days in the fall for goose hunters or timber.

Senator FOWLER. Well, I understand the traditional easement—I guess I am trying to use my words carefully—what would be a traditional use of an easement, control by the landowner and let them hunt and fish on it. But you specified grazing, what else?

Mr. TURNER. Specifically grazing, timbering, hunting and fishing were the activities that I had mentioned where the taxpayers, yes, they have paid——

Senator FOWLER. I would submit that most people would think that would be an untraditional use for wetlands.

Mr. TURNER. The easements that we have applied mostly are all they are, the only constraints we put on the landowner is you cannot drain, fill or burn the wetland, just take care of it, keep it the way it is, protect it, and the other issues including grazing, the landowner continues to utilize. I think one of the real advantages of easements is it gives a great deal of flexibility to work with the SCS and the landowner, and of course, they are completely voluntary on behalf of the landowner. If he does not like the application and the deal, he does not become a player. So it would be voluntary.

CONCLUSION

Mr. Chairman, just in conclusion, the easement would be administered either by a Federal, State organization, perhaps even a private local land trust or organization or even the landowner himself might be the enforcer. The goal would be to take not less than 10 percent of whatever expansion we allowed in the CRP program. If it is up to 40 million, that would mean about 600,000 acres allowed to be put into wetlands. In conclusion, I think it would be a positive partnership with the landowners. The landowner, I think, would find it acceptable because he would get paid for the value of his land. The Government would put money into restoring the wetland and he could continue to gain if he so chooses economic return from other uses.

Our experience shows that landowners will be interested. Two, we believe wetland restoration works; we have had very positive successes. And I just think it is an excellent opportunity to take the farm bill program and put some pluses back on the side of the no-net-loss equation. Thank you, Mr. Chairman.

Senator FOWLER. Thank you very much, Mr. Turner.

[The prepared statement of Mr. Turner follows:]

TESTIMONY OF JOHN F. TURNER, DIRECTOR, U. S. FISH AND WILDLIFE SERVICE, DEPARTMENT OF THE INTERIOR, BEFORE THE SENATE COMMITTEE ON AGRICULTURE, SUBCOMMITTEE ON CONSERVATION AND FORESTRY, CONCERNING THE 1990 FOOD SECURITY ACT

MARCH 29, 1990

Mr. Chairman, I am pleased to be here today to discuss the Service's present Farm Bill related wetland restoration program and to provide our views concerning the proposed establishment of a wetland restoration reserve. From a Service perspective expansion of Federal efforts to restore wetlands is both timely and of the utmost importance.

For many years conservationists have viewed the continuing loss of wetlands with alarm. More recently this concern has become widespread. The President has now challenged us with the national goal of "no net loss" of wetlands. To achieve this goal will require the cooperative efforts of every segment of society. . One way to move toward that is an ambitious wetland restoration effort. Deliberations concerning the 1990 Food Security Act provide a most appropriate forum through which wetland restoration efforts can be enhanced or accelerated.

The Service is currently engaged in a very successful wetland restoration program. Though for many years involved in small-scale restoration projects, primarily on National Wildlife Refuge lands, the Service in 1987 initiated a nationwide wetland restoration program. The focus of the restoration effort includes Farmers Home Administration inventory lands, lands enrolled in the

Conservation Reserve Program, and private agricultural lands in general.

Individual wetland restoration projects on agricultural land tend to be small in size and relatively inexpensive to implement. The size of the wetlands may vary from less than one acre to several hundred acres. Few of the individual restoration projects exceed twenty acres. Wetland hydrology is typically re-established by the installation of droplog or gated pipe structures, levees and small dams, tile breaks, ditch plugs and similar structures. In the Southeast, the restoration may combine the re-establishment of bottomland hardwoods with wetland hydrology improvement.

In the past 3 years, Service efforts in regard to the Farm Bill program have resulted in the restoration of nearly 55,000 acres of wetland hydrology, including approximately 5,000 acres of associated bottomland hardwood re-establishment on approximately 3,100 individual sites. The goal for FY 1990 and 1991 is to restore approximately 45,000 additional acres each year.

Much of the restoration work has thus far been implemented by Service personnel using our own equipment. We are now moving toward the use of contract work. Initial restoration costs generally average less that $150 per acre. The Service utilizes its wetland restoration appropriations for the direct coordination, planning and actual construction of the projects, but does not purchase land rights. At least 70 percent of the available funds go to actual on-the-ground restoration activities. All Farm Bill restoration projects are located on lands where necessary rights are available to the Service without charge. Before a restoration project is implemented on private lands, the Service secures a no-cost agreement that will adequately secure the restoration. Priority is given to restorations secured by long-term or permanent easements. However, the term of that agreement may, in some instances, be for as little as 10 years. By far the most desirable and suitable lands on which the Service currently implements its wetland restoration projects are those covered by permanent Farmers Home Administration wetland easements.

If the Service were actually purchasing an easement on the land involved, as in the proposed wetland reserve, it would certainly not be cost-effective or appropriate to conduct restoration activities on lands that would be protected for such a limited period of time. That is why, as I will discuss later, the Administration supports the acquisition of permanent easements under the proposed wetlands reserve program.

Your letter of invitation included a series of questions concerning how a wetland restoration reserve could be implemented. My remaining comments are structured in a question-and-answer format:

What lands should qualify and how are they best selected and by whom?

Restorable cropped wetlands and adjacent upland buffer areas should qualify. The actual selection of lands for inclusion in the wetland restoration reserve should be based on comparison of the projected wetland benefits to be regained versus the cost of acquisition and restoration. Both the Service and the Soil Conservation Service have expertise that could be utilized in the selection process. The Service would bring to the selection process a strong perspective in wetland values and management, while the Soil Conservation Service would provide a solid focus in engineering design and agricultural integration and impact.

What is the status of present wetlands restoration projects (e.g., can it be done)?

Restoration can be done. Approximately 55,000 acres of wetlands have been restored under the Farm Bill related program. In most instances the beneficial results of the restoration are apparent within one year. Much of the restoration effort is focused on sites where the soil conditions and topography make it very easy to restore the hydrology necessary to support the types of wetland vegetation that previously occurred on the site. It often can be much easier to plug a drainage ditch or block a tile drain than it was to install the facility initially. Following one growing season these sites usually resume the appearance of undisturbed sites, including the return of wildlife species. Prairie pothole restoration is an example of this.

Some restoration efforts result in the establishment of conditions different than those which occurred naturally. For example, in the Lower Mississippi River Valley, flood control projects have altered the seasonal pattern of overflow. Here the Service may install structures in depressional areas, or swales, to hold water. The structures may have the capability of being manipulated to partially draw down the impounded water during the late spring and summer so that natural grasses, sedges and other wetland vegetative plant species can become established. With the fall and winter rains, the depressions are permitted to hold the runoff and a productive freshwater marsh condition occurs. Where desired, these same areas can be manipulated to provide conditions suitable for the re-establishment of woody vegetation. These areas are commonly referred to as moist soil management areas. They take on the appearance of a natural freshwater marsh in only one growing season or of a woody wetland thicket in five to seven years.

In previously forested wetland areas, a restoration project may entail the establishment of bottomland hardwoods in conjunction with establishment of interspersed moist soil management areas. The bottomland hardwood re-establishment sites will immediately become productive from an overall vegetative wetland perspective. This is the result of cessation of cropping and the natural establishment of early successional invader species. The time required before the site once again regains forest characteristics, including production of heavy mast, may be thirty years. By carefully selecting the proper tree species to plant and by utilizing a diversity of species, the time required for restoration of relatively natural and diverse forest characteristics is greatly reduced in comparison to the time that could be required for natural succession to return such areas to a diverse forest composition that includes heavy mast bearing species.

Without a doubt, the restoration of wetlands on previous wetland sites where the soils, topography and rainfall conditions are suitable is relatively easy and cost efficient. The same cannot be said for attempts to create wetlands where none previously existed or in wetland environments where physical processes are rigorous, for example on sandy spoil deposits and excavated uplands in the coastal zone. Therefore, reclamation of wetlands converted for agricultural use provides the optimum opportunity for wetlands restoration.

What type of wetland restoration approaches will provide the most return (i.e. length of easement, etc.)?

The focus should be on the acquisition of permanent easements. For the program to be fiscally responsible, it will be necessary to secure long-term or permanent easements in order to justify the costs of acquiring necessary land rights coupled with the costs of restoration. The Service has purchased in excess of 1,200,000 acres of primarily wetland easements during the past 20 years, with most of this acreage being in the Prairie Pothole Region and in permanent easements. Landowner interest in the present program continues to be positive. While Service easements provide primarily for wetland protection rather than wetland restoration, we expect landowners to accept also the opportunity to enter into the proposed wetland restoration easement program. As long as the terms of the easement are clear from the outset and reasonable economic uses of the easements area are allowed, landowners should be willing to participate in permanent easement programs.

How should restoration plans be formulated and by whom?

Restoration plans should be designed to achieve optimum wetland benefits. Service biologists and Soil Conservation Service District Conservationists could jointly prepare the actual restoration plans. Service biologists would focus on the achievement of the greatest wetland benefits. The Soil Conservation Service District Conservationists would insure that the restoration plans are technically feasible from an engineering and overall farm management perspective. Landowners would be involved in the process so as to avoid any unnecessary conflict with their farming operations.

How should economic use of the easement areas be addressed?

Before each easement purchase agreement is signed by the landowner, the provision for economic use should be clear. The Service biologists and Soil Conservation Service District Conservationists should develop the specific criteria based on broader established guidance that both Departments agree upon for such uses, and should include them in a "Wetland Easement Conservation Plan." The document would be signed by both agencies and the landowner. A provision for future modification of the plan, when the three parties concur in the change, would be included in the document.

Criteria for timber harvest, grazing, and recreational use, including hunting and fishing, would be established in the plan. As long as the wetland conservation purpose for which the wetland restoration easement is established is not adversely impacted, landowner use would be allowed.

In the case of grazing regulation, the responsibility for any fencing would rest with the Federal Government and not the landowner. A plan for timber management would describe how harvest would occur. Hunting use would generally be consistent with State season and bag limits. In the case of migratory bird hunting, any special limits on the number of days per week and the hours of the day that hunting could occur would be established by the U.S. Fish and Wildlife Service. In instances where endangered species considerations are involved, more stringent limits on economic use could be involved.

All economic use restrictions would be established at the time of initial purchase and would not change except by consensus among the landowner, Service, and Soil Conservation Service. Obviously, the hunting seasons and bag limits could change based on the statewide or national season framework changes that may become necessary. The control of public access would reside with the landowner.

How should restoration projects be funded and implemented and by whom?

Presently, the Department of Agriculture would provide most of the restoration funding. In some instances the Service could utilize its restoration funds. Private sources such as Ducks Unlimited could be utilized, which is in keeping with and in support of the Administration's interest in private sector partnerships. It may be possible to include the landowner in some of the actual restoration effort. Much of the restoration work would likely be done under contract.

How should the operation, maintenance, administration, and enforcement of the easements be handled?

The responsibility for looking after the public investment must reside with a Federal agency, possibly an agency having land management capability. The Service is certainly willing to contribute to the effort. The day-to-day operation and management of a restored wetland could be undertaken by a variety of Federal and State agencies, along with private conservation organizations. Also, in many instances the day-to-day activity will be minimal, and the landowner could be the party chosen to take care of such matters as an integral part of the easement purchase agreement.

How large should the reserve be and what role would it play in achieving a goal of no net loss for wetlands?

The reserve, as proposed by the Administration, will be an extension of the present Conservation Reserve Program. There are approximately six million acres of acreage authority remaining. The Administration's goal is for that at least ten percent, and up to 2.5 million acres, of the remaining reserve acreage be utilized as wetland easements. However, the effort to enroll large acreages of wetlands should not override the need to ensure that acres actually enrolled are of the potential quality to provide public wetland benefits commensurate with the costs involved.

A wetland restoration reserve will be one component of the national goal of no net loss.

Mr. Chairman, this concludes my prepared remarks. I will be pleased to answer any questions you or other members of the committee may have.

Senator **Fowler**. Mr. Marion Berry, a farmer from Gillett, Arkansas.

Mr. **Berry**. Thank you, Mr. Chairman.

Senator **Fowler**. You are welcome. Are you going to Denver this weekend?

Mr. **Berry**. No, sir, but I would like to.

Senator **Fowler**. We are glad to have you here.

STATEMENT OF MARION BERRY, RICE AND SOYBEANS FARMER, GILLETT, AR

Mr. **Berry**. As you said, I am a farmer, and I am a member of the Arkansas Soil and Water Conservation Commission.

ON-FARM WATER STORAGE AND WETLANDS

I would like to limit my remarks today to incentives for construction of on the farm reservoirs for the storage of excess surface water to replace ground water in irrigation and also to the current impact of the wetlands policy on production agriculture in our State. Even though we have 50 inches of rainfall a year, this rainfall comes at the wrong time for us to use to grow our crops.

Senator **Fowler**. What kind of a farmer? Are you a rice farmer?

Mr. **Berry**. Yes, sir, rice and soybeans.

Consequently, our farmers use ground water instead of surface water and we are overdrafting the aquifer now some 17 percent in our State, and we can see real problems in sustaining our level of production if we do not do something about it. And we are trying to deal with that before we get into a crisis situation. By overdrafting our ground water, we are getting into not only a quality problem but a quantity problem. We feel like that we can use this excess surface water if we can build on-farm storage reservoirs to hold this water until it is needed in the summertime.

One of the things that would help us do this is to allow these reservoirs to be built on areas now that is put in crops and let it be counted as set-aside. Also, if we could change the CRP program to allow for permanent storage of surface water, it would be very helpful. The State of Arkansas has taken the first step in implementing this program by creating a tax credit program for the development of surface water and also for conservation measures concerning water. It would also be good if we could have a cost-share and low interest loan program to encourage the development of this surface water. The recent changes in section 404 of the Clean Water Act permitting changes in the definition of wetlands has just created real problems in Arkansas as far as our ability to build these reservoirs even though we are trying to do some things on land that we have farmed in some cases in excess of 150 years. We do not have the ability any more to go in there and build these reservoirs even though it would take this land out of production and enhance the environment in our opinion in these particular places.

But we have literally been stopped from doing anything, even maintaining our conservation plans that have been in place for many, many years, and things that we have, measures we have taken at the recommendation of the Soil Conservation Service over the years. We cannot even maintain those at the present time because nobody knows what we can and cannot do or where we can or cannot do it, it does not seem like.

Senator **Grassley**. Ask him to be specific in what he might be able to maintain or not maintain.

Mr. **Berry**. We have levies at the bottoms of our fields and then we put drop pipes in them, and this has been done over, gosh, at least over my lifetime and more, and we have maintained these to keep the runoff from coming off so fast off the fields and allowing it time to settle out and settlement time to fall out. And now you have to have a 404 permit to even go in there and repair rusted out pipe or that sort of thing.

Senator **Grassley**. Would that be a different situation in the Midwest where we maintain our terraces on hillsides? Are you saying that we might have trouble maintaining terraces?

Mr. **Berry**. If you are like eastern Arkansas is where virtually everything there is considered wetlands under the new definition. We never had any problem with it until now. We are just now encountering this.

Senator **Grassley**. You have to maintain terraces or pretty soon——

Mr. **Berry**. Right.

Senator **Grassley** [continuing]. You know, you are going to lose all your soil. I mean that is why the terraces are there. They are there strictly for soil conservation. Go ahead.

Senator **Fowler**. Well, as Mr. Berry may or may not know, we have been working very closely with Senator Pryor on this problem, which is certainly in the reliance on ground water in Arkansas is almost unique, and we have included Senator Pryor's recommendations in our conservation bill, which I think you will like, which will recognize those unique problems.

Mr. **Berry**. Yes, sir. We think Senator Pryor's bill and also a bill by Congressman Anthony and one by Congressman Alexander from Arkansas would all help our situation without doing any harm to anything else.

Senator **Fowler**. Thank you, Mr. Berry, very, very much.

[The prepared statement of Mr. Berry follows:]

TESTIMONY OF MARION BERRY
OF GILLETT, ARKANSAS
Before the
Senate Agriculture Subcommittee
on Conservation and Forestry
Concerning the Conservation Title
of the Proposed 1990 Farm Bill
Washington, DC
March 29, 1990

Marion Berry is engaged in the farming of approximately 2,200 acres of rice and soybeans in southern Arkansas County, Arkansas, near Gillett. Mr. Berry is a member of the Arkansas Soil & Water Conservation Commission which establishes state policy relative to soil conservation, non-point source pollution, water rights, dam safety, water resources planning and development, flood control and floodplain management. Mr. Berry enjoys bird and game hunting.

I welcome this opportunity to present testimony concerning the conservation title of the proposed farm bill. My comments will primarily address the following topics: (1) Conservation Reserve Program; (2) Conservation Compliance; (3) Initiatives For Construction of On-Farm Water Storage; and (4) Wetlands Conservation.

Conservation Reserve Program

The conservation provisions of the 1985 Food Security Act have been well received and successful in Arkansas. Approximately 225,000 acres of croplands under over 2900 contacts have entered the Conservation Reserve Program ("CRP").

While ensuring the maintenance of adequate supplies of commodities, I would recommend that the CRP cap on acreage participation be raised. The program has been very successful protecting our resources without significant adverse impact to the farmer. Further, the Secretary of Agriculture should have the ability to waive the 25 percent cap in areas that have had difficulty meeting conservation compliance or other required environmental goals. There should be a waiver of the 3 year ownership rule for participation in the CRP when land is obtained by foreclosure, bankruptcy, etc. If 75 percent of the farm qualifies for CRP, the rest of the farm should be allowed to be placed in the CRP, with a cap of 25 acres.

When current contracts expire, farmers should have the option to re-bid for an extended contract of not less than 3, and up to 10 years in duration. Acceptable rental rates might include consideration for economic use of CRP acres. If the producer elects not to produce a crop on expired CRP acres and maintains the existing cover crop, the preservation of base history should be extended for a period of not less than 5 years. Also, CRP land which is brought back into production after contract expiration should not be considered "sodbusting". There should be a minimum 2-year implementation period for the conservation plan adopted for the CRP land, and a longer period in cases where the plan requires structures to be constructed.

Conservation Compliance

Since 1985 the Soil Conservation Service ("SCS") in Arkansas has completed over 31,000 highly erodible land determinations. Of these 6,650 farms were determined to have highly erodible land. Over 5,700 conservation compliance plans have been developed on over 510,000 acres. The attitude of Arkansas farmers about conservation compliance has been positive.

The technical requirements for such conservation plans and systems must be based on local resource conditions, available conservation technology and the cost-effectiveness of the required conservation treatment. The plans should be based on the local SCS field office technical guide, which should include alternative conservation systems designed to achieve reduction in existing soil loss levels, but which are at the same time cost-effective for the given situation.

Under current rules, every farm must be in compliance in order for a producer to be eligible for program and other federal benefits, even though his landlord may prevent him from applying an approved conservation plan on rented land. The new law should not require offsetting compliance, so that the producer would be ineligible for program benefits only on those farms which are out of compliance with the erosion requirements. Also, third party activities, such as drainage district activities, over which the farmer has no control should not disqualify him from participation in USDA programs.

Incentives For Construction Of On-Farm Water Storage Reservoirs

In 1989, the Arkansas Soil & Water Conservation Commission completed a major update of the Arkansas Water Plan, the state's comprehensive program for the orderly development and management of the state's water resources, which among other things, shows an overdraft of groundwater in much of eastern Arkansas. Groundwater, which is primarily used for agricultural irrigation, is being mined at a rate 17% greater than it is being recharged.

These areas have excess surface water, which is not now being used. The development of on-farm storage reservoirs is one method to reduce the use of groundwater. The state of Arkansas has a tax-credit program to encourage the conversion from groundwater to surface water use..

I would recommend that the conservation title of the 1990 farm bill contain provisions to allow any new lands devoted to storage of water to be counted as permanent set-aside under USDA farm programs. This would encourage the conversion from groundwater to surface water use in the areas where the groundwater resource is being depleted. Senator Pryor of Arkansas has made such a proposal that should be incorporated into the 1990 farm bill.

Also, changes in the definition of wetlands under Section 404 of the Clean Water Act have become a great obstacle in the development of on-farm reservoirs necessary in the conversion from groundwater to surface water use.

Wetlands Conservation

To date the majority of the wetland determinations in Arkansas have not been completed. An estimated workload of approximately 31,000 wetland determinations faces the SCS in Arkansas. Attitudes concerning the swampbuster provision in Arkansas has not been as positive as previously mentioned. Arkansans are as dedicated to the preservation of wetlands as farmers in other states, however, the inclusion of "farmed wetlands" into the provisions has set the stage for adverse impacts in Arkansas that may not be felt in other states. The wetlands definitions are both too strict and extremely hard to quantify or monitor. The scope and effect determinations that the SCS in Arkansas will be required to make will be very time consuming, preventing SCS personnel from providing other needed technical assistance to Arkansas land users. I would recommend that the swampbuster provisions should be amended to exempt all cropland that was being actively farmed before the provision was signed into law. This would expedite the process, allowing more attention to be provided for the conserving of the remaining unconverted wetlands, which the swampbuster provisions were originally designed to protect.

A new section should be added to swampbuster to allow the producer to convert an existing wetland to other uses after meeting mitigation requirements. The mitigation would ensure no net loss of wetlands while allowing the farmer to manage the farmland according to his needs, without violating swampbuster and losing USDA benefits.

The current swampbuster provisions should be amended to clearly state that conversions of wetlands of a size considered to be *de minimis* on the total resource will not cause the land owner to be ineligible of farm program payments. .

The bill should have provisions to institute voluntary programs to provide farmers with a variety of options for protecting wetlands. These will include a rental program such as an expanded water bank or CRP, purchase of long-term easements, and purchase permanent easements on existing wetlands to ensure against conversion.

The bill should also provide for a voluntary program to restore natural wetlands characteristics to drained wetlands. The program should provide for federal cost-sharing on measures needed to restore the wetlands' characteristics and should not be limited to just the wetland, but will also include any uplands which will enhance the wetland and may be necessary to insure its integrity. The federal government could offer the land owner the option of receiving annual rental payments (such as a CRP contract), selling an intermediate-term easement (25-50 years), or selling a permanent easement on the land involved to provide for it's protection as a wetland. Additionally, if annual rental payments were discontinued, the area that is restored wetland should be exempt from swampbuster requirements.

The environmental equation can not be balanced on the backs of land owners or farmers, without society in general having to pay for it, as attempted in the 1985 farm bill. There is no free lunch.

Respectfully submitted,

Marion Berry

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Senator **Fowler**. We welcome Mr. Peter Berle, the president of the National Audubon Society.

STATEMENT OF PETER A.A. BERLE, PRESIDENT, NATIONAL AUDUBON SOCIETY, NEW YORK, NY

Mr. **Berle**. Good afternoon, Mr. Chairman. I apologize for not being here when you began. I was testifying about the Niobrara River on the other side of the Capitol earlier this afternoon.

Senator **Fowler**. Well, we will send you some of our old videotape and you can catch up.

Mr. **Berle**. Well, I am about to give you one which has to do with ducks and wetlands which may be appropriate.

Senator **Fowler**. Oh, good.

INTRODUCTION

Mr. **Berle**. This is one of the National Audubon television specials which I think is particularly appropriate as we meet today because it deals with wetlands and their impact both on agriculture and wildlife. I welcome the opportunity to speak because I think we have all come to realize that farm legislation is much more now than maintaining price supports and dealing with short-term needs of farmers. It is one of those pieces of the net that describes the ecological conditions which we are creating and maintaining for the country. And so what you do has a tremendous impact on resources, particularly on wetlands resources. I am not going to go through the history of our loss of wetlands and the efforts that have been made by the Congress and others to deal with the issue in the past. That is contained in my formal statement which, I trust, will be entered into the record.

Senator **Fowler**. It shall be. Forgive me, Mr. Berle, I have just got to step out for just a minute.

Mr. **Berle**. Sure.

Senator **Fowler**. Mr. Grassley will continue.

SWAMPBUSTER

Mr. **Berle**. Thank you. I would like to address particularly some of the provisions in the 1985 farm bill which you will be reviewing as they are related to wetlands protection and most specifically those relating to swampbuster. We had all hoped that swampbuster would help arrest the loss in wetlands and to some degree it has been successful, although I think from our perspective not as successful as many of us had hoped. Numbers are somewhat uncertain, but it is our guess that about 300,000 acres have gone since the swampbuster provisions were enacted. Those are acres which at least in theory were being protected by the swampbuster provisions. We suggest that one of the difficulties in terms of providing for wetlands protection through swampbuster is that they are triggered—the swampbuster sanctions, the loss of Federal support—are triggered by the harvest of the crop rather than by the destruction of the wetland.

And therefore, one can have circumstances under which wetlands are destroyed, but if there is not a commodity which is marketed as a result—even though the farm itself is under wetlands protection—there is no sanction. Thus the sanction is not very effective in terms of protecting the resource. One of the things that we suggest is that as you look at this again that the swampbuster sanctions be applied when the wetland is destroyed, not when the product is sold. Another relevant factor is the period during which swampbuster sanctions apply. Now when you are out of the program the sanctions disappear, and people are able to get in and out of the program depending on what is happening to the price situation.

What we recommend is that the swampbuster provisions last for 5 years and other conservation provisions last for 5 years after the person signs up for the first time or when they leave the program. What that means, then, is that if you violate the provisions within 5 years after leaving the program, you lose your base year. Therefore, you cannot simply pull out of the program, violate the provisions, maintain your base year and come back in later. What we are suggesting is that even though you are out for 5 years, the sanctions remain if you violate the conservation provisions. And so that you cannot be adding credit, base year credit, while you are violating conservation provisions which were intended to be part of the whole support program.

TYPE 1 AND 2 WETLANDS

One of the things that we think is also worthy of particular attention is some of the things that you are being lobbied to take out. We are particularly concerned about those that would argue that the category 1 and 2, type 1 and 2 wetlands should be excluded from swampbuster provisions. Those are the seasonal wetlands, which are so critical, particularly with respect to waterfowl. I am embarrassed to sound like too much of an expert on waterfowl with my colleague Mr. Turner here, who reminds me that he began his career with a grant from the National Audubon Society to finish his master's thesis on wildlife research.

However, these type 1 and 2 wetlands do account for approximately 30 percent of our national inventory, and those are the ones that are particularly vulnerable to destruction through agricultural practices. So we think that they should remain within the purview of the act. We are also concerned about those that argue that it is by definition a good deal if you substitute 2 acres of created wetlands for 1 that you destroy. And while the arithmetic of that sounds enticing, we just do not think that we know enough about how these systems work to be able to be assured that if you put a dam in some place else, you are recreating those natural systems that you are destroying.

So we are all for creating more wetlands and doing as much as we can to mitigate, but we are not comfortable with the notion that there ought to be a simple 2 for 1 tradeoff because we just do not think we know enough about the resource to be able to recreate it.

AGRICULTURAL WETLANDS RESERVE PROGRAM

The other thing that I think is of particular significance to us is that the agricultural wetlands reserve program, which has been proposed by many, and involves, obviously, the use of easements to secure and protect wetland values go forward. We think the proposals to put the AWR reserve at the 5 million level is sound and should be pursued.

We are concerned about what may be a conflict between an AWR program and the CRP program. Under the CRP program, the landowner might well be in a position in which he makes more money, perhaps even more than the land is worth through CRP, and that that is used as a more desirable option than the AWR program. Our preference for AWR is that if you have an easement it is of longer duration. We would argue that it should be perpetual. Under CRP you are out in 10 years, and we regard that, while helpful, as perhaps more expensive and less efficient than an AWR program.

ONE LARGER ISSUE

Then there is one larger issue that I would like to touch on. And that has to do with the continuing circumstance under which lands wind up in Federal domain as a result of various farm credit programs that involve unfortunately the surrender of lands if the farmer goes under. Now under FmHA, easements can be put on wetlands and other critical parts of those lands prior to the time that they are transferred by FmHA. It turns out that if some of those lands go back to the original owner, that provision does not apply. And we would suggest that given the expenditure of taxpayer dollars that goes on in that whole process that it is not unreasonable to put conservation easements on some of those lands if they go to the original owner or anyone else.

It is also, and the technical side of this is more complicated than is worth spending time on here, but the Federal Credit System lands do not necessarily follow the same pattern. And we would suggest that the overall concept should be that if lands come into the Federal domain as a result of a financial failure of the owner that we ought to be quick to put conservation easements on those particular parts of those lands that really should not be developed, and that that value should be recognized through debt forgiveness. In effect, we should use the default to pay for conservation easements. Then those lands could be returned to whoever so that they can be managed in a way which reflects the preservation of their special ecological values for which easements have been acquired through this process. Thank you.

Senator FOWLER. Thank you, Mr. Berle.

[The prepared statement [9] of Mr. Berle follows:]

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[9] The attachments to the prepared statement of Mr. Berle are retained in the subcommittee file. The attachments are: Investigation of Ethylene Dibromide (EDB) in Ground Water in Seminole County, Georgia, by James B. McConnell and others, U.S. Geological Survey Circular 933, prepared in cooperation with Exposure Assessment Branch, Hazard Evaluation Division, Office of Pesticide Programs, Office of Pesticides and Toxic Substances, U.S. Environmental Protection Agency; Nutrient Movement in Streamflow from Agricultural Watersheds in the Georgia Coastal Plain, L.E. Asmussen, J.M. Sheridan, C.V. Booram, Jr., 1979—TRANSACTIONS of the ASAE (1979 American Society of Agricultural Engineers 0001-2351/79/2204-0809$02.00); and Estimating the Effectiveness of Vegetated Floodplains/Wetlands as Nitrate-Nitrite and Orthophosphorus Filters, by P. Yates and J.M. Sheridan, Agriculture, Ecosystems and Environment, 9 (1983) 303–314, Elsevier Science Publishers B.V., Amsterdam—Printed in The Netherlands.

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Statement of

Peter A. A. Berle
President of the National Audubon Society

At the Hearing

on

The Conservation Title of the 1990 Farm Bill

March 29, 1990

Before the

Senate Committee on Agriculture, Nutrition, and Forestry
Subcommittee on Conservation and Forestry

AMERICANS COMMITTED TO CONSERVATION

Mr. Chairman and Members of the Committee, I deeply appreciate the opportunity to present the following testimony for the National Audubon Society. My name is Peter A. A. Berle. I am the president of the National Audubon Society, an active conservationist, and a farmer. As requested, I am here today to recommend federal farm policies that would promote the protection and restoration of one of the nation's most valuable and threatened natural resources: wetlands. I am especially pleased to be able to make a statement on an issue which is of the greatest concern to Audubon's half-million members.

Mr. Chairman, I suggest to you that the parameters of the Farm Bill debate have undergone a subtle but fundamental change over the last five years. The passage of the Food Security Act of 1985 ushered in a new era of farm policy, an era in which federal farm programs must explicitly recognize the government's responsibility for protecting the natural resources on which American agriculture relies. No longer can the central themes of farm legislation be limited to the short-term needs for commodity price control, foreign trade adjustment, and farm income support. The traditional goals of federal farm programs must henceforth be balanced with a more inclusive array of conservation needs. As we have come to understand agriculture's effects on wildlife, water quality, soil productivity, and myriad other natural resources, we have realized that farm programs can never again operate in an "environmental void". Farm programs must now be evaluated for their effects on natural resources, and the success of a Farm Act will depend as much on its environmental as on its economic impacts.

It is one thing simply to articulate broad environmental objectives for federal agricultural policy. But it is a far more difficult task to create reasonable farm legislation that reflects the federal government's responsibility for protecting and enhancing natural resources. In creating the 1990 Farm Act, legislators must ask themselves if they are to build upon the conservation initiatives of the 1985 Farm Act, or retreat from its important environmental goals. In the hope that we can make genuine progress towards a more environmentally sustainable future in the 1990 Farm Bill, and with the recognition that a wide range of resource considerations deserve careful scrutiny, we offer our statement today on wetlands.

Wetlands: A Brief History

Not so long ago most people thought of wetlands merely as pestilential wastelands which served no useful purpose. Federal policies were created to assist in the conversion of wetlands to what were thought of as more productive uses. Draining, filling, excavating, and flooding wetlands were considered to be in the public's best interest, so national laws which subsidized and facilitated the wholesale destruction of millions of acres of wetlands were passed as early as the mid-1800's.

Since then, the scale of wetlands destruction in the U.S. has been staggering. The U.S. Fish and Wildlife Service estimates that when the first white settlers arrived in the new world, there were more than 200 million acres of wetlands in the continental U.S. Today fewer than 95 million of these acres remain -- in other words, over half of wetlands in the lower 48 states have been lost. And estimates indicate that, from the mid 1950's to the mid 1970's, between 300,000 and 500,000 acres of wetlands were lost to conversion each year.[1]

As bad as national estimates of wetlands destruction are, losses in certain regions have been particularly alarming. California has lost over 90 percent of its original wetlands; Iowa has lost fully 99 percent of its wetlands. And in the tablelands surrounding the Platte River Valley, less than ten percent of the wetland basins or "prairie potholes" present at the time of white settlement remain today, despite their critical value for waterfowl habitat and the difficulties inherent in pothole drainage.[2]

As we are coming to recognize the scale of wetlands destruction in America, we are also coming to understand the value of what we have lost. Scientific evidence for the importance of wetlands is overwhelming. Nearly one-third of our nation's endangered and threatened species live in, or are in some way dependent on, wetlands. Some 5,000 species of plants, 190 species of amphibians and one-third of all bird species in the United States are found in wetlands habitats. More than 12 million ducks breed each year in wetlands. And wetlands provide critical habitat for most of the sport and commercial fish caught in U.S. waters each year.[3]

Wetlands also play a vital role in regulating the hydrological regime. Wetlands can mitigate the danger of flood damage by serving as reservoirs for flood waters. Wetlands store water at the wettest times of the year and release it at a constant rate, helping to maintain steady stream flows. Wetlands create groundwater pressure, which helps to prevent the intrusion of saltwater into coastal water tables. And they can improve surface water quality by filtering out sediment and other pollutants from waters that flow through them.

Wetlands serve an especially critical hydrological function by stabilizing groundwater levels. Lowering a water table can accelerate the downward movement of waterborne pollutants into aquifers, as indicated in a study conducted in Georgia by James McConnell. His report, which I have appended to this testimony, demonstrates that reduced water tables are often associated with findings of contaminants in groundwater. By helping to maintain a steady supply of water to underground aquifers, wetlands play a vital role in ensuring adequate supplies of clean groundwater for drinking and agricultural use.

Despite the substantial and diverse benefits provided by wetlands, it was not until recently that the federal government has taken action in protecting wetlands. The Migratory Bird Conservation Act of 1929 was the first significant federal wetlands protection law, but insufficient appropriations rendered it ineffective in conserving wetlands. At the same time, agricultural expansion, fueled by government cost-sharing and tax write-offs for drainage expenses, accelerated the destruction of wetlands, especially in the "prairie pothole" region in the north-central U.S.

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[1] W.E. Frayer et al., *Status and Trends of Wetlands and Deepwater Habitats in the Coterminus United States, 1950s to 1970s* (Colorado State University, Fort Collins, Colorado, 1983), p. 3.

[2] Shildman, G. 1981. Update Wetland Survey of the 1960's. Nebr. Game and Parks Comm., Lincoln. 2 pp.

[3] Peter Berle, Remarks to the Biennial Southeast Regional Conference of the National Audubon Society, November 5, 1988.

Recognizing that existing programs could not keep pace with the rate of wetlands habitat loss, Congress in the late 1950's and early 1960's took some tentative steps toward wetland preservation. The passage of the Wetlands Loan Act of 1961 and of amendments to the Migratory Bird Stamp Act of 1934 permitted acquisition of valuable wetlands habitat in the prairie pothole region. Nonetheless, funds were only adequate to protect a small percentage of potholes, and government subsidies for wetlands conversion continued unabated.

In 1962, amendments to the Soil Conservation and Domestic Allotment Act created a valuable precedent for subsequent wetlands protection measures. For the first time, government subsidies for wetland drainage in North Dakota, South Dakota, and Minnesota could be withheld if such drainage was determined to be harmful to wildlife. Although this provision did not slow significantly the rate of wetlands conversions, it did introduce the concept of discontinuing federal assistance for the destruction of wetlands.

The passage of the Water Bank Act of 1970 created further opportunities to protect wetlands. The Water Bank program allows landowners and operators in important waterfowl nesting and breeding areas to enter into agreements with the Secretary of Agriculture to preserve wetlands and adjacent uplands on their lands in exchange for annual payments. Water Bank contracts last for ten years and are renewable, allowing for the potential of long-term protection of valuable wetlands. Annual rental payments for wetlands in the Water Bank averaged a mere $16 per acre, making the Water Bank a particularly cost-effective tool for wetlands protection.

The only federal program regulating proposed activities in wetlands was established by the Clean Water Act of 1972. Section 404 of this Act requires that anyone discharging dredged or fill materials into waters of the United States, including wetlands, must obtain a permit from the Army Corps of Engineers.

However, there are serious deficiencies in the effectiveness of the 404 program, especially as it pertains to agriculture. First, it fails to regulate many activities responsible for wetlands destruction, including drainage, excavation, flooding and clearing. According to a report by the Office of Technology Assessment, 80 percent of wetlands losses from the mid-1950's to the mid-1970's involved draining and clearing wetlands for agricultural purposes. Secondly, *ongoing* agricultural activities on lands that were once wetlands and which may exhibit some or all of the characteristics of wetlands are exempt from regulation under section 404. Finally, a "general" permit, which does not require permit holders to avoid, minimize or compensate for for wetland losses of less than 10 acres, may be used instead of individual permits. These "non-permits" apply to many agricultural conversions.

The inability of the 404 permitting program to control the conversion of wetlands for agricultural production heightened the awareness that agricultural policy was working at cross purposes to national wetlands protection objectives. As evidence of agriculture's contributions to wetlands losses accumulated, it became increasingly evident that federal farm programs were subsidizing wetlands destruction by increasing commodity payments to farmers who planted agricultural commodities on converted wetlands.

Swampbuster

In order to correct the conflict between national wetlands policies and the federal farm programs, Congress enacted the Swampbuster provisions of the 1985 Farm Act. Swampbuster disqualifies agricultural producers from eligibility for federal commodity program assistance, including commodity price supports, loans, crop insurance, and storage payments, if they produce agricultural commodities on wetlands which have been drained or otherwise substantially altered. Swampbuster was designed to reduce the loss of wetlands to agriculture, which have historically constituted 87% of all wetlands losses in the continental United States. Since the penalties were tough, it was hoped that Swampbuster would provide a substantial deterrent to wetlands conversions.

Five years after enactment, Swampbuster must be regarded as only partially successful. The excellent regulations promulgated by the USDA received 8400 public comments -- more than any other rule in USDA's history. And, according to a recent assessment by the Soil and Water Conservation Society, Swampbuster has succeeded in reducing the rate at which wetlands are converted to cropland.

Nevertheless, Swampbuster has not effectively halted the conversion of wetlands for agricultural purposes. Estimates indicate that over 300,000 acres of wetlands have been converted on lands held by producers who receive federal commodity support since the passage of Swampbuster.[4] Very few Swampbusters have been cited for violations, and most have successfully appealed their penalties.[5] Furthermore, the Soil and Water Conservation Society evaluation found that Swampbuster violations, whether inadvertent or intentional, are occurring.[6] County ASCS committees, the agencies responsible for determining Swampbuster violations, are composed primarily of farmers, and committee members have been understandably reluctant to penalize their neighbors for their illegal cropland conversions. Furthermore, the workload placed on the USDA and the Fish and Wildlife Service for tracking Swampbuster violations has been overwhelming.

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[4] Testimony of the National Wildlife Federation before the House Committee on Agriculture, Subcommittee on Conservation, Credit, and Rural Development, March 8, 1990.

[5] According to the National Wildlife Federation, only 26 Swampbusters *nationwide* have been denied federal farm program benefits, and 401 of 427 Swampbuster appellants have successfully appealed their penalties; according to ASCS, 137 producers have lost program benefits for Swampbuster violations.

[6] Max Schnepf et al., *Implementing the Conservation Title of the Food Security Act*, (Soil and Water Conservation Society, 1990), p. 38.

The problems with Swampbuster enforcement stem largely from loopholes in existing legislation. The Swampbuster penalty is currently triggered by the *harvest* of a commodity from a drained wetland. A producer may therefore convert a wetland for a variety of reasons -- to produce a non-commodity crop, to increase his commodity program base history, or in the hope that his conversion will be overlooked or that program rules will change -- and still receive full government commodity program benefits. Current Swampbuster provisions inevitably fail to fully protect wetlands from the threat of conversion for agricultural production.

In addition, by penalizing only those farmers who produce agricultural commodities on drained wetlands, current law places an impossible burden on the government agencies responsible for determining Swampbuster violations. Not only must SCS and FWS make technical determinations regarding whether or not a wetland has been converted, they must also keep track of the planting history of a converted wetland to determine if it is ever used to produce a commodity crop. Federal agencies are simply unable to ensure effective and consistent Swampbuster enforcement under current law.

To close these loopholes, the definition of a Swampbuster violation should be changed from the harvest of an agricultural commodity on a drained wetland to the act of draining, excavating or otherwise altering a wetland. Not only would such a change better protect wetlands by deterring conversions for purposes other than the production of program crops, it would also greatly facilitate enforcement by eliminating the need to track the planting histories of converted wetlands.

Swampbuster can be improved in other ways. To compensate for the lack of technical wetlands expertise in ASCS committees, the Fish and Wildlife Service should be granted a concurrence role in determining Swampbuster violations. Service personnel have the training and the philosophical orientation to assist ASCS committees in implementing Swampbuster in a way that is most beneficial to wetlands resources. In addition, regulations should explicitly permit formal administrative appeals of Swampbuster determinations by any citizen with a demonstrated interest, not just producers who have lost farm program benefits. Citizen appeals could help to ensure that government resource management decisions are held accountable both to producers and to the general public.

Under current legislation, Swampbuster penalties can be assessed only in years when a producer participates in a federal commodity program. When commodity programs are not in effect, or when high commodity prices allow producers not to enroll in farm programs, Swampbuster doesn't deter wetlands conversion. However, producers can still accrue benefits from commodity programs even when they don't participate. A commodity program base history increases the value of cropland, and such a history can be recorded with the ASCS regardless of whether a producer is enrolled in a commodity program. Thus, a producer who harvests crops from drained wetlands can still receive the indirect program benefits of increased land values.

To make the law more effective, producers should be required to comply with Swampbuster and other environmental requirements for five years after enrolling in a commodity program. For each year of non-compliance, he should not be permitted to maintain a cropping history with ASCS. A farm operator would thus lose one fifth of his base acreage for each year he fails to protect his wetlands. This would effectively prevent periodic program participants from benefitting fully from federal farm programs without appropriately caring for natural resources.

I believe that such legislative changes can make Swampbuster more effective. I am deeply troubled, however, that a number of proposed changes to Swampbuster would have devastating impacts on wetlands resources. One proposal would exempt type I and II wetlands from Swampbuster requirements. Since these "seasonal" or "ephemeral" wetlands may hold water for only a few weeks each year, they are often regarded as having little or no value as wildlife habitat. In reality, though, type I and II wetlands serve as critical mating and feeding grounds for migratory waterfowl; blue teal, for example, rely heavily on these early-thawing wetlands as food sources, and their populations would suffer if this crucial habitat were destroyed. According to the 1982 National Resources Inventory, there are over 31 million acres of type I and II wetlands in the continental United States; this represents a full third of the remaining wetlands acres in the lower 48 states. Clearly, a Swampbuster exemption for type I and II wetlands would have disastrous effects on an already threatened resource and on the waterfowl that depend on it.

Other changes to Swampbuster could have equally deleterious impacts on wetlands values. One suggestion would permit a producer to convert one acre of wetlands for agricultural production on the condition that he create two more acres of wetlands elsewhere on his land. There are inherent technical problems with such a "compensatory mitigation" proposal. Little is known about how to restore hydrological and wildlife habitat values of converted wetlands, and the relationships between ephemeral wetlands and deeper wetlands are as difficult to ascertain as they are to duplicate. Although wetlands restoration is by all means desirable, full recovery of pre-conversion soil and vegetation conditions is rarely achieved in practice. Furthermore, the costs of restoring wetlands can be exorbitant; Audubon is now involved with a restoration project outside of Los Angeles with a multi-million dollar pricetag. Any wetlands conversion program that is labelled "mitigation" must address these and other technical, biological, and financial concerns, and must be undertaken in such a way as to assure a gain in the quantity and quality of wetlands resources.

Technical considerations aside, such proposals ignore that Swampbuster is intended to halt federal farm subsidies that in the past have encouraged conversion of wetlands for production of agricultural commodities. Given that intent, there is no justification for allowing compensatory mitigation to offset wetlands losses under the framework of Swampbuster, since farmers already have the option of foregoing farm program benefits and managing wetlands as they see fit.

Moving Beyond Swampbuster: Restoration and Long-term Protection for Critical Wetlands

Although Swampbuster can protect wetlands from conversion to agriculture, the law only affects participants in federal farm programs. If prices improve sufficiently, or if commodity programs are eliminated, Swampbuster and other conservation measures that tie resource stewardship to federal commodity benefits will be superfluous.

Furthermore, although Swampbuster can slow the rate of wetlands losses in the United States, it can do nothing to help regain valuable wetlands habitat lost to conversion over the past two centuries. Wetlands restoration is especially critical in areas that have suffered the most severe losses, because even small gains in wetlands acreage in such regions can have enormous value for wildlife. Without an effective program for wetlands restoration, it will be difficult to meet, and impossible to move beyond, a policy of "no-net-loss" of wetlands, either regionally or nationally. Although the USDA did place over 400,000 acres of restored wetlands into the CRP, these wetlands may be converted back to cropland with impunity after contracts expire. Public funds expended on CRP wetlands restoration may be lost in as little time as it takes to open a plugged drain.

The 1990 Farm Bill must create new opportunities for wetlands restoration, and should promote the permanent protection of sensitive lands of all types, including wetlands.

Audubon was a member of the Wetlands Forum, a task force convened by the Conservation Foundation at the request of former EPA Administrator Lee Thomas to address major policy concerns about how the nation should protect and manage its valuable wetlands resources. The Forum was chaired by former New Jersey Governor Tom Kean; Governors Booth Gardner of Washington State and Carroll Campbell of South Carolina served as co-vice chairs. Agricultural, ranching, and silvicultural interests were represented on the Forum, as were the oil, gas, and home building industries, academicians, local and state governments, and environmentalists. USDA served in an ex oficio capacity, as did EPA, the Army Corps of Engineers, the National Marine Fisheries Service, and the Fish and Wildlife Service.

One of the Forum's principle recommendations was the establishment of an Agricultural Wetlands Reserve (AWR) to preserve 5 million acres of current wetlands and restore 2.5 million acres of converted wetlands. The AWR would consist of wetlands placed under permanent easements purchased from agricultural producers, and would ensure an enduring wetlands legacy for generations to come.

AWR easements could take a variety of forms. Some wetlands, along with adjacent uplands, might be placed under an easement prohibiting drainage, cropping, and all other practices potentially damaging to wetland values. Such wetlands and uplands would provide valuable habitat and hydrological functions year-round, and would be afforded permanent protection from drainage or other degradation. For some seasonal wetlands, easements might permit cropping but prohibit planting or plowing during critical periods, and would prevent drainage in perpetuity. Such easements would protect waterfowl habitat values of ephemeral wetlands while allowing a farmer to produce crops when appropriate.

The AWR would create substantial new opportunities for wetlands restoration. Producers would be given financial incentives to restore previously converted croplands back to wetlands in return for permanent easements. This constitutes a more fiscally responsible approach to protecting restored wetlands than the current CRP program, in that it protects the public investment in wetlands restoration permanently, not just for 10 years.

Some critics claim that an easement program would be too expensive. In our view, however, permanent easements are one of the most cost-effective means of protecting wetlands. CRP rental payments over the life of a 10 year contract often exceed the value of the land rented -- in other words, it would sometimes be cheaper to buy a restored wetland than to place it in the CRP. An easement prohibiting drainage but permitting cropping, however, would cost substantially less than the purchase price of the cropland placed under easement, and would give permanent protection of wetlands habitat values. And for the estimated 4.6 million acres of cropped wetlands that are currently providing negative financial returns to farmers, and which therefore have little value as cropland, permanent easements prohibiting cropping and drainage would not be expensive. Easement mechanisms thus have the potential for low-cost, permanent wetlands protection.

The advantages of an easement program would, however, be undermined by offering competing incentives for wetlands protection. One administration proposal would give producers the option of placing wetlands in the CRP for ten years or placing wetlands under permanent easement. The availability of relatively high per acre payments, under CRP contracts obligating owners for only 10 years, would out-compete (and bid up the cost of) a permanent easement program. Federal monies would continue to pay for inefficient, short-term wetlands protection, and expenditures for wetlands restoration would remain uninsured.

I was pleased that Senator Lugar's bill, S. 1063, introduced in 1989, provided for a 2.5 million acre wetlands reserve. I was most pleased, however, when you, Senator Fowler, introduced S. 970, which called for permanent easements of up to 5 million acres in a wetlands reserve.

Mr. Chairman, S. 970 also provided for easements for the establishment of permanently vegetated stream borders, filter strips of permanent grass, forbs, shrubs, and trees, wildlife corridors and areas of habitat critical to wildlife, and riparian corridors to provide a link between wetlands which connect the hydrologic regimen. I cannot emphasize enough how important and far-sighted that provision is. Perhaps I can illustrate its importance by using an example from your own state. For many years the Coastal Plain Experiment Station of the University of Georgia at Tifton and the USDA Southeast Watershed Research Program have conducted studies on the movement of nutrients in streamflow from agricultural watersheds in the Georgia coastal plain. Their findings have an important bearing on the filterstrip provisions in S. 970. The work of Drs. Asmussen, Sheridan and Booram supported previous studies that showed that the maintenance of natural vegetation along streams results in significant improvements in water quality, while substituting crops for natural streamside vegetation can increase sediment and nutrient loadings in surface water.[7] It only makes sense to provide for permanently vegetated stream borders where such have been removed, and I urge you to restore that provision in legislation you are putting together. (See studies by Asmussen and Yates, attachments B and C)

Other Opportunities for Wetlands Protection

Although voluntary easements on wetlands should form a cornerstone of federal wetlands conservation efforts, there are other opportunities to provide cost-efficient and permanent protection for wetlands. One innovative wetlands protection program, administered jointly by the FWS and FmHA, allows FWS to identify and enhance wetlands in the FmHA inventory. In exchange, FmHA places permanent conservation easements on identified wetlands at the time of lease or resale of the land. The program receives administrative force from Presidential Executive Order 11990, which requires that all federal agencies protect and enhance wetlands when planning to dispose of land. The program may affect more than 500,000 acres of wetlands in the FmHA inventory. So far, about 25,000 acres of wetlands have been placed under permanent easement pursuant to an agreement between the agencies reached in 1987.

Since lands in the FmHA inventory are owned by the government, the program aims to protect wetlands that have been paid for with public monies. Nonetheless, in January of 1989, the USDA claimed that the easement program was in conflict with the Agricultural Credit Act of 1987, which mandates that a prior owner or operator of a farm which has been repossessed by the FmHA be given the first opportunity to lease or repurchase the defaulted land. The USDA therefore decided that it had the administrative discretion to determine the extent to which the wetlands Executive Order applied to this category of borrowers, and has refused to place conservation easements on inventoried lands. Although attorneys for the President's Council for Environmental Quality and for the Department of the Interior find no conflict between the law and Executive Order 11990, the USDA maintains that easements violate "private" property rights.

It is most unfortunate that USDA is fighting this golden opportunity to protect wetlands. The Department's claim that prior farm owners are penalized by the program is weak. Since easements tend to be placed on the poorest and most flood-prone soils, they have little impact on the economic viability of farms. And, if a wetland conservation easement is placed on part of a property, a prior owner essentially receives the easement area for little or no cost, because the land is devalued for purpose of repurchase.

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[7] L. E. Asmussen, J. M. Sheridan, and C. V. Booram, Jr., "Nutrient Movement in Streamflow from Agricultural Watersheds in the Georgia Coastal Plain", *Transactions of the American Society of Agricultural Engineers* (Vol. 22, No. 4, pp. 809-821).

P. Yates and J. M. Sheridan, "Estimating the Effectiveness of Vegetated Floodplains Wetlands as Nitrate-Nitrite and Orthophosphorus Filters", *Agriculture, Ecosystems, and Environment*, (Vol. 9, pp. 303-314).

Furthermore, FmHA debt restructuring costs taxpayers substantial amounts of money. FmHA borrowers unable to repay their loans are often forgiven from debts far greater than the value of the defaulted properties. Moreover, if prior owners wish to repurchase land they have reconveyed to FmHA, they may receive federally subsidized loans at significantly lower than market interest rates. Since the government is spending billions of public dollars to restructure farm debt, protection of natural resources is a logical requirement. Yet the program has been stalled by administration opposition. If the nation is ever to halt the loss of wetlands and provide permanent protection for valuable wildlife habitat, such programs must be allowed to proceed.

The federal government should seek to ensure that all outlays of public funds be used in ways consistent with the protection of wetlands. In 1987, for example, Congress authorized a multi-billion dollar bail-out of the Farm Credit System, as well as federal guarantees for farm real estate assistance. In return for this substantial assistance, these lenders should require their borrowers to adhere to Swampbuster and other environmental requirements. Federally assisted farm lending should not subsidize the degradation of natural resources and the environment.

The Wetlands Forum has offered a variety of other suggestions that could have significant benefits for wetlands. For example, Congress could enact legislation that would allow for the establishment of nonprofit Wetlands Preservation Trusts. These trusts would acquire full ownership of conservation easements on wetlands identified by the Fish and Wildlife Service or appropriate state agencies, and on adjacent uplands, by donation, purchase, or land exchange. Owners donating lands to such trusts would be eligible for certain technical and financial assistance, including tax benefits, and the conditions of the trusts would place limits on what uses could be made of properties they acquire. Similarly, farmers with outstanding loans to the FmHA could be encouraged to sell conservation easements on critical wetlands on their farms in exchange for a partial waiver of their debt. Easements could be held by a public agency or transferred to a nonprofit organization or a Wetlands Preservation Trust.

Congress should also eliminate all remaining tax incentives for destroying wetlands. The Tax Reform Act of 1986 prohibited tax deductions for "soil or water conservation" measures that result in wetlands drainage, and disallowed preferential tax rates for increases in land values resulting from wetland conversions. The Internal Revenue Code should now be amended to prohibit both the capitalization and deduction of all expenditures for draining, filling, or otherwise converting wetlands, as well as for other activities damaging to natural resources that provide substantial public benefits.

Above all, federal laws and policies must be consistent in discouraging the destruction of wetlands. We must scrutinize all levels of government to make sure that federal actions promote the interests of this precious resource. The 1990 Farm Bill provides a unique window of opportunity to improve our nation's performance in protecting the environment for our children and grandchildren. We must use this opportunity to its fullest.

I appreciate your time and consideration.

Senator **Fowler**. Mr. Todd Herreid. Is that right.

Mr. **Herreid**. Yes, that is correct.

Senator **Fowler**. Good. From the Sierra Club in Fargo, North Dakota.

STATEMENT OF TODD J. HERREID, VICE CHAIR, DACOTAH CHAPTER, SIERRA CLUB, FARGO, ND

Mr. **Herreid**. Yes, Mr. Chairman, I would like to thank you for the opportunity to participate in these hearings. I think this is an important process in trying to feel our way through this whole portion of the farm bill.

INTRODUCTION

My name is Todd Herreid, I am vice chair of the Dacotah Chapter of the Sierra Club, and I am speaking on behalf of our 800 members in North and South Dakota. I am here today to speak for my Chapter and in turn, the more than over half-million Sierra Club members nationwide.

CONCERN AND THANKS

I am speaking today as a volunteer conservation leader in the Sierra Club as well as an avid waterfowl hunter and a native North Dakotan who has hunted the prairie pothole region for an excess of 20 years. My concern for the wetland resources of our country run very deep.

I know that this concern is shared by Members of Congress, and publicly I would like to acknowledge and thank the leadership of the late Senator Ed Zorinsky, and of Senator Bob Kasten, Senator Tom Daschle for the work that they had previously done in the 1985 farm bill and the conservation provisions.

Originally, when the 1985 conservation provisions came out, I was very hopeful of the change that this would bring about in agriculture and some of our agricultural practices. I have witnessed in North Dakota a real alarming decline in waterfowl numbers since I started hunting ducks as a child.

I think the most disturbing case that really exemplifies the problem that we are facing in the prairie pothole region is that of the pintail. The pintail is a duck that requires the relatively shallow water habitat some of the marginal wetlands that have come into conflict. And from 1955 until 1988, the fall flight of pintails has decreased by a full 55 percent.

STATISTICS ARE WARNING SIGNS

The reason I discuss these statistics is that I feel these statistics are warning signs. You know waterfowl are not the only things that need wetlands. People need wetlands, too. As I stated earlier, the passage of the Food Security Act had really raised my hopes that farming was, and some of our farming practices were, going to really turn toward the wetland preservation and conservation attitude. But it was not too long before I learned that swampbuster was not working as it was intended.

In 1988, with other Sierra Club members, I submitted some Freedom of Information requests to some of the counties in North

Dakota to acquire documentation regarding the granting of commenced conversion exemptions under the 1985 swampbuster law, and the first thing that we heard from the ASCS was that we would have to pay for the time and the office work required to fulfill our request.

So we spent a great deal of time and effort feeling our way through the Freedom of Information Act before we could even obtain these records and see exactly what the ASCS had been doing as far as granting exemptions to swampbuster. You know of the 26 counties that were involved in this, the bills added up to somewhere around $3,000. One county alone, Wells County, North Dakota, the total of the bill was in excess of $800, and for a volunteer conservation organization, as the Sierra Club is, that gets to be quite tidy sum to try to deal with. And as this task grew and grew, I found myself working 20 hours and more a week, and most of that time was spent trying to convince State and national ASCS officials that our requests were in the public interest. Subsequently, through feeling our way through the Freedom of Information Act, we got a fee waiver granted by the Administrator of the ASCS, Mr. Bjerke, here in Washington. For example, in Cavalier County, we found that the ASCS had granted four of eight exemptions to the swampbuster law by seriously misconstruing the rules.

REVERSAL OF EXEMPTIONS

Since that time, we have appealed through an informal process to the State committee these exemptions that were granted in error, and every single one of them has been reversed. And the ASCS itself allows that in Minnesota half of 600 swampbuster exemptions that were granted were probably granted in error. I found that the swampbuster issues really tended to cluster around a few issues.

Senator **Fowler**. What was the error? Why?

Mr. **Herreid**. Do you want a specific example of what an error was that we noticed?

Senator **Fowler**. Well, what most of them were. Was it misapplication of the law or ignorance of the law or the rules or what was the reversible error?

Mr. **Herreid**. Well, I think it is difficult to say exactly what was the mind of the county committee when they made their rulings, but basically it dealt with what commenced the conversion of the wetland. And the county committee was saying that actual conversion of the wetland commenced when, for example, brush and rocks had been removed from the wetland, and our argument was that did not start conversion of the wetland. Those could be steps that you would take to produce a crop from a wetland in a normal drought year such as we have been suffering in North Dakota recently. It did not indicate that that wetland was actually starting to be drained. So things like that is what the misapplication of the rules centered around.

Senator **Fowler**. OK.

Mr. **Herreid**. You know it is difficult to name every single situation that we ran into in the time that we have here.

Senator **Fowler**. Go ahead and finish. I am sorry for interrupting you.

A FUNDAMENTAL FLAW, THOUGH, WITH THE 1985 LAW

Mr. **Herreid**. That is fine. There was a fundamental flaw, though, with the 1985 law. We believe that the county committee system would give us good enforcement of the swampbuster provisions, but then as it has turned out in practice and through what I have found, clearly this has not worked.

Another problem is that the 1985 law, as written, swampbuster protects wetlands obliquely. Now this is because it is not the initial conversion of the wetland that constitutes a violation of the provisions, but rather the production of a crop on that land.

Another thing that shows that swampbuster in 1985 is a bit weak is it allows farmers to maintain a cropping history while being poor stewards of the wetlands. You know if you are not in the farm program, you can violate the conservation provisions but still maintain your cropping history, and we feel that definitely weakens the swampbuster provisions.

THE SIERRA CLUB IS ADVOCATING SEVERAL CHANGES TO STRENGTHEN SWAMPBUSTER

So the Sierra Club is advocating several changes to strengthen swampbuster.

First of all, we encourage the shift of the violation to be rather than the production of the crop to be the act of draining of the land or the conversion, and we think that would close a major loophole in the law.

Second of all, we feel that the Fish and Wildlife Service, with its longstanding expertise in technical matters of wetland determinations and wetland management, should be given the primary enforcement role for swampbuster.

Third, the citizens must be given better access to the administrative process under which the swampbuster determinations are being made. By this, I mean the appeals that we were filing are through an informal process that is not specified in the CFR's, and I think that a third party process would benefit both producers and the public, in general, if that was spelled out in the CFR's

Fourth, farmers should meet compliance with swampbuster and the additional conservation requirements set forth under the Food Security Act, and upcoming 1990 farm bill, for a full 5 years after entering a farm commodity program.

CONCLUSION

The Sierra Club strongly feels that we must join arm and arm, though, with the agricultural community in providing for a conservation program in the 1990 farm bill, and we want to work toward that goal. No one is sure what will happen if we do not stem the loss of our wetland heritage in the United States, but there is a growing chorus of those who do not wish to find out what will happen. Thanks for allowing me this opportunity to testify.

Senator FOWLER. It was very helpful, Mr. Herreid. Thank you so much.

[The prepared statement of Mr. Herreid follows:]

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TESTIMONY OF TODD J. HERREID

VICE-CHAIR OF THE

DACOTAH CHAPTER

SIERRA CLUB

BEFORE THE

SENATE SUBCOMMITTEE ON CONSERVATION AND FORESTRY

MARCH 29, 1990

"When we try to pick out anything by itself, we find it hitched to everything else in the universe." *John Muir*

National Headquarters: 730 Polk Street, San Francisco, California 94109 (415) 776-2211

PRINTED ON RECYCLED PAPER

Mr. Chairman, members of the Committee, I want to thank you for the chance to testify on behalf of the Sierra Club. I am Todd Herreid, Vice Chair of the Dacotah Chapter, which counts 800 members in North and South Dakota. I am here today to speak for my Chapter and in turn, the more than half-million Sierra Club members across the country. My remarks today will center on the need to strengthen the Swampbuster provision of the current law and move forward on wetlands protection.

I speak today also as a volunteer leader of this national conservation organization, and as an active waterfowl hunter, a native North Dakotan who has hunted the prairie potholes of this state for two decades. My concern for the waterfowl resource runs deep.

I know that concern is shared by members of Congress. I would like to publicly acknowledge and thank the leadership of the late Senator Ed Zorinsky (D-NE), and of Senator Bob Kasten (R-WI), and Senator Tom Daschle (D-SD) for their efforts to craft the original Swampbuster legislation in the Food Security Act of 1985 to protect wetlands, and thus our waterfowl resources.

Yet I have witnessed the steady and alarming decline of our waterfowl populations. I am aware that the U.S. Fish and Wildlife Service has survey data that span the years from 1955 to 1989 and demonstrate that some populations of ducks are at the lowest levels recorded.

Populations of mallards, ducks loved by hunters and birdwatchers alike, slid 25 percent from 1955 to 1989. In the same period, populations of American wigeons fell 19 percent. Fall flights of the graceful blue winged teal crashed 34 percent.

Perhaps the most disturbing case is that of the northern pintail, a species that relies upon small, shallow wetlands that dot the western edge of the prairie pothole region of North Dakota. These seasonal, ephemeral wetlands -- considered by some as "nuisance areas" -- are vital to the pintail. The continued drainage of wetlands for agriculture has contributed to the decline of these birds: From 1955 to 1988, the fall flight of pintails decreased by a full 55 percent. The breeding population was 10,124,000 in 1956; by 1989 it had sunk to 2,471,000. [1]

I include these statistics because they are warning signs. Waterfowl are by no means alone in their reliance on wetland habitats. Endangered species need wetlands, too. More than half of the species --plant and animal-- currently listed as endangered rely on wetlands to complete their life-cycles. We count on wetlands, too, for their unique functions as spawning grounds for sport-fish and shellfish, as filters for pollution, as storage tanks for floodwater, as re-chargers for groundwater, as homes for upland game birds and fur-bearers, as recreational areas, as soil and water banks for farmers.

Waterfowl are mirrors of the condition of our wetlands, ecosystems that are now imperiled in many states. In California, 90 percent of the wetlands are gone. Iowa has lost nearly 99 percent of its wetland base. Since 1953, 76 percent of the wetlands have been destroyed in Minnesota. Illinois, only ten percent of the wetlands remain. And in my own state, where my concern is greatest, about half of the wetlands are gone.[2]

The passage of the Food Security Act of 1985, with its Swampbuster provision, raised my hopes for better stewardship of our state and our nation's wetlands. At last, a law addressed the fact that well over three-fourths of the wetland drainage is completed for agricultural purposes. Finally, taxpayers would cease subsidizing wetland destruction.

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[1] Status of Waterfowl and Fall Flight Forecast, U.S. Fish and Wildlife Service, Canadian Wildlife Service, July 25, 1989

[2] Tiner, R., Wetlands of United States: Current Status and Trends. U.S. Fish and Wildlife Service, National Wetlands Inventory, Washington, DC., 1988

However, it was not long before I learned that Swampbuster was not working as intended -- or was not being enforced as intended. In spite of strong statements by national leaders for a "no net loss" of wetlands,[3] from my vantage point in Cavalier County, North Dakota, drainage was proceeding.

In 1988, I chose to become more involved as a Sierra Club member on this problem. With other Sierra Club members, I requested, under the Freedom of Information Act, to examine county documents on the disposition of alleged Swampbuster exemptions granted by the county committees. First, we heard from several counties that the Sierra Club would have to pay for the time and office work required to fulfill our request, this upon instruction from the state Agricultural Stabilization and Conservation Service director. The 26 counties involved sent the Club advance bills that came to about $3,000.

Though one by one, most county fees weren't large, collectively they became burdensome to a non-profit, volunteer-driven organization such as the Dacotah Chapter. In one case, in Wells County, the fee amounted to $800. It was only after many hours of communications with the Agricultural Stabilization and Conservation Service, at the national level, that the fees were waived for 26 North Dakota counties. Yet we suffered a setback after receiving our original fee waiver. We had to again plead for fee waiver to gain access for two additional counties.

Eventually, the Sierra Club made requests for all Swampbuster exemptions occurring since 1985 in all counties north and east of the Missouri River. We covered the entire Missouri Coteau, drift prairie, as well as the North Dakota portion of the Red River Valley. As the task ballooned, I found myself working 20 hours per week as a citizen conservationist on this project, and much of this time was devoted to convincing state ASCS officials that our requests were in the public interest.

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[3] President Bush, speaking at a June 6, 1989 International Waterfowl Symposium sponsored by Ducks Unlimited, called for no net loss of our nation's wetlands, saying "It is time to stand the history of wetlands destruction on its head. From this year forward, anyone who tries to drain the swamp will be up to his ears in alligators."

In Cavalier County, we found that the ASCS county committee granted four of eight exemptions by seriously misconstruing the rules. Since that time, all of these exemptions, granted in error, have been reversed. The ASCS itself allows that in Minnesota, as many as half of the 600 Swampbuster exemptions granted were in error.[4]

Despite the frustrations involved in this fact-finding process, and despite being stonewalled by the state ASCS, my experience was valuable. I found that Swampbuster enforcement problems cluster around a few issues.

First, I found that although the 1985 law calls for determinations to be made by county committees, there is a fundamental flaw in this process that prevents proper implementation of the 1985 Swampbuster law. In 1985 we believed the county committee structure would give us good enforcement. Clearly, this has not worked.

County board members are not eager to punish fellow farmers because in many cases, they are living next door to the violators. Much of the time, they feel pressured to wink and nod at violators. The county committee structure makes it equally difficult for citizen conservationists to participate in the process -- a process in which they have much at stake. This places the ASCS in the awkward position of playing a "Jekyll and Hyde" role. On one hand, the ASCS assists farmers in procuring the benefits of the farm program; on the other, it is required to have sole custody of Swampbuster enforcement. It is the Sierra Club's position that the ASCS is not willing to play those conflicting roles.

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[4] Pates, Mikkel, Burdick measure softens "swampbuster." Fargo Forum, Tuesday, March 27, 1990.

As the 1985 law is written, Swampbuster protects wetlands only obliquely, because it is not the initial conversion, but the subsequent production of a commodity crop from the land, that constitutes the Swampbuster violation. Farmers can and do still convert wetlands (and fail to produce commodity crops) while still participating in Federal farm programs. The Sierra Club sees this as a major flaw in the existing law.

The Swampbuster provision of the 1985 law is also weak in that it allows farmers to maintain a cropping history while being poor stewards of our nation's wetlands. Farmers who move in and out of the farm program may drain wetlands in one year while outside the farm program; establish a cropping history on the land; and then move back into the farm program and be beneficiaries of public funds through the farm program. In this way, we continue the taxpayer-subsidized destruction of wetlands.

The Sierra Club advocates several changes to strengthen Swampbuster.

* First, we encourage changing the violation from the production of a commodity crop to outright conversion of the wetland in question. This would close a large loophole in the current law.

* Second, Sierra Club believes that the Fish and Wildlife Service, with its long-standing expertise in technical matters of wetland determinations and management, should be given the primary enforcement role for Swampbuster.

* Third, citizens must be given better access to the administrative process under which Swampbuster determinations are made.

* Fourth, farmers should meet compliance with Swampbuster and the additional conservation requirements set forth under the Food Security Act,

and upcoming Farm Bill 1990 for a full five years after entering a farm commodity program.

The Sierra Club views the Swampbuster provision -- as well as Sodbuster and the conservation compliance requirements -- of current law as an historic step forward. But it was one step in a long walk toward a more environmentally-sensitive agriculture. We will not accomplish this larger goal if we fail to advocate financial incentives for long-term wetlands protection, and fail to work towards better funding for programs, such as our Water Bank Program and the new North American Waterfowl Management Plan, that are already in place. We must join arm in arm with the agricultural community to properly implement these programs, as well as the Swampbuster provision of the 1985 law.

The Sierra Club supports legislation that creates a wetlands reserve, and we favor the bills calling for easements on as many as 5 million acres. It is gratifying to us to see bills introduced by Senators Fowler and Lugar, for example, that clearly address the urgency of our duty to protect wetlands. It is apparent that Members of the Committee are concerned about the rapid and continuing loss of our wetlands.

No one is sure what will happen if we do not stem this loss of our precious natural resources, but there is a growing chorus of those who do not wish to find out.

Thank you for allowing me this opportunity to testify.

Senator **Fowler**. Last but not least, Cindy Deacon Williams, the National Wildlife Federation.

STATEMENT OF CINDY DEACON WILLIAMS, LEGISLATIVE REPRESENTATIVE, FISHERIES AND WILDLIFE DIVISION, THE NATIONAL WILDLIFE FEDERATION, WASHINGTON, DC

Ms. **Williams**. Yes.

INTRODUCTION

My name is Cindy Deacon Williams, and I am happy to be here this afternoon and have the opportunity to talk to you about wetlands issues.

VALUE OF WETLANDS

Wetlands, of course, are noted for many values. We have had a lot of discussions already on the waterfowl values of wetlands, and that is the one that is self-evident. The values that are not quite so well known are these that are probably very important and of interest to farmers, and those values also deserve protections: Values like the ground water recharge functions of wetlands, the fact that wetlands moderate floods and droughts, and the fact that the presence of wetlands helps maintain soil moisture.

We had some discussions earlier from the Worldwatch Institute about how the increasing desertification in other parts of the world is forcing countries into situations where they are unable to produce the necessary food to feed their own people. If we in the United States continue with the kinds of wetlands degradation that we have seen to date, we too could find ourselves in a situation where our soils do not maintain enough moisture in order to sustain the agricultural practices of this Nation over the long haul. Swampbuster was passed in 1985, at least in part, in recognition of the immense values that wetlands provide to our society. We think the recognition in existing law not only needs to be maintained, but, the tools that we are using to retain and save those values for our grandchildren and their grandchildren must be strengthened.

WE NEED TO DEVELOP A VERY STRONG EASEMENT PROGRAM

By itself swampbuster is not going to get the job done. In addition to that tool, we need to develop a very strong easement program. Many of the ideas that have been discussed on this panel and by the earlier panel are things that we, too, think are good ideas. An easement program on wetlands certainly needs to strive for perpetual protection of the wetlands, particularly if there is a strong infusion of public dollars to restore the values of that wetland.

A NUMBER OF ECONOMIC USES THAT ARE COMPATIBLE WITH WETLAND CONSERVATION EASEMENTS

We, too, think that there are a number of economic uses that are compatible with wetland conservation easements. The critical element is that the wetland not be converted—do not drain it, do not fill it—but if the farmer wants to wait until after a temporary wetland has dried in the spring, and then hay it, there is probably not a problem. The economic use must not remove the wetland value that is there in the spring and is so important to the entire system and makeup of that region.

SWAMPBUSTER IS INEFFECTIVELY IMPLEMENTED AND ENFORCED

To strengthen swampbuster, we have a number of proposals that are the result of the work that has been done in our prairie wetlands office in North Dakota over the last 5 years where they have spent a considerable amount of time and effort monitoring swampbuster implementation and enforcement. Unfortunately, what they have found is that by and large the implementation and enforcement of swampbuster has been abysmal. We continue to see wetlands on farms that are receiving farm program benefits converted. And, very few people have been found in violation of swampbuster and had their benefits withheld. Those that have had benefits withheld have had only moderate amounts withheld. The impact of the law, in fact, has not been that great. There was some discussion by the previous speaker about exemptions and some of the problems with commenced exemptions and commenced determinations. You might want to refer to my testimony where we discuss this issue starting on page 20.[10]

Some of the things that are happening, though, are even more blatant distortions of the law than the idea of giving a commenced determination to a wetland where some brush has been removed. We are in litigation right now on a drainage project in Bottineau County in North Dakota known as the White Spur Drainage Project. A commenced determination was issued on that project despite the fact that not only had there not been any clearing on that property, there had not even been drainage plans completed. There had not been any dirt removed. There had not been a contract executed to remove any dirt. Nothing had happened out there, and yet the county committee gave a commenced determination, based on a gleam in somebody's eye.

That kind of disregard for the law cannot be allowed to continue if swampbuster is to affect any progressive and reasonable protection for wetlands in this country. There are a number of things that we think are inherent in the way the law is structured that are creating difficulties with implementation.

RECOMMENDATIONS

As a result of that, we have a number of recommendations for changing the law to facilitate its implementation in subsequent years. One proposal has been mentioned already by a number of people, and that is moving the trigger for the violation so that if a wetland is converted a farmer cannot qualify for farm program benefits. Right now, as you know, a farmer not only must convert, but also must plant commodity crops on that acreage to trigger a violation.

There are a whole series of problems associated with that dual trigger. Not only does it fail to focus the law on the kind of action that you are trying to discourage, but it also creates a bookkeeping nightmare for the county committees. For example, a wetland could be converted this year, forcing county committees to track it in perpetuity down through the years to determine whether or not a commodity crop subsequently is planted on that land thereby violating the law. That problem, of course, exists for the farmer as well. They have to remember in every subsequent year where the wetland used to be in the absence of wetland characteristics or else be in a situation where they have to forfeit their benefits. Shifting and focusing the trigger to the time when the wetland is converted would solve all of those problems. We recommend it highly.

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[10] See p. 651 for the prepared testimony of Ms. Williams.

Our second proposal also has been talked about a little bit. It is the idea of a more open administrative appeals process. We frankly think that was intended in 1985. If you go back and look at the language of the law, it says that anyone who is aggrieved can appeal through an administrative process. However, when that statute went over to the Department of Agriculture for development of regulations, they looked through the world as they deal with it, and the Department of Agriculture deals with farmers.

The fact that someone who was not a producer found to violate the law and therefore in danger of having their benefits withheld could possibly be aggrieved by a decision of that committee was not on the Department's mind. We think it was an error on their part, and we would very much like to see this committee direct the Department to correct that error so that anyone who can show that they have been harmed by a decision can appeal through the administrative process. It is certainly conceivable that if that option is available, a number of controversies could be resolved at the administrative level without having to take that final step into litigation. Some obviously will not be so resolved, but many should drop out through that filter.

The third thing that we would like to see is the provision of greater technical assistance to the county committees that are trying to reach these decisions. County committees were originally established and designed to work with the commodity program benefits. They are very good at that. They are farmers. They know those programs better than anyone else could conceivably do. But to ask the county committees to implement a law that deals with wetlands is going beyond what they are capable of handling because that is not where their knowledge lies. We recommend that in order to resolve this problem, the Fish and Wildlife Service be——

Senator FOWLER. Do you agree with that, Mr. Berry?

Mr. BERRY. No, sir.

Senator FOWLER. For the record he said no. Good. Go ahead. What is number four?

Ms. WILLIAMS. We would like to see the Fish and Wildlife Service have a concurrence role on swampbuster decisions that allows them to bring in their technical and biological understanding of wetlands and assure that the decisions that the committee is making are really based on the biology of what is going on out there. Similarly, we also——

Senator GRASSLEY. In practice they are doing that right now.

Ms. WILLIAMS. Actually no.

Senator GRASSLEY. In practice they are doing it right now.

Ms. WILLIAMS. We have found a number of situations where county committees regularly hold hearings without notifying the Fish and Wildlife Service so that the option has not been there for the Fish and Wildlife Service to consult. In fact, a study recently released by the Soil and Water Conservation Society documents a number of situations where swampbuster decisions have been made without consultation with the Fish and Wildlife Service. We think the obligation to involve the FWS needs to be strengthened or we will continue to see those problems. There are a number of other issues that I would like to address very briefly.

Senator FOWLER. We have your whole testimony, Ms. Williams, if you will wind up because——

Ms. WILLIAMS. Yes. I am winding down here.

The issue of exemptions has been raised fairly extensively by a previous panel. Much of the controversy is arising simply because of confusion with the new delineation methodology recently agreed upon by a number of agencies. I also would like to refer you to the testimony starting on page 33 [11] that deals with the issue of the confusion and conflict that has arisen between section 404 of the Clean Water Act and swampbuster.

I have an area where I also disagree with Mr. Berry, and that is what kinds of things 404 prohibits a rice farmer in the lower Mississippi Valley from doing. Basically any normal ongoing agricultural practice does not have any obligations with section 404.

They can maintain their systems. The only time farmers run into 404 concerns is if they are expanding their effect on the waters of the United States. If they are not extending, specifically if they are not discharging fill material or dredge material into the waters of the United States, section 404 does not have jurisdiction. In the case of rice farming specifically, therefore, such activities as maintenance of existing, currently serviceable rice levies are exempt and do not require any action. Rice production as an accepted part of a rotation also is exempt and does not need any 404 action in order to comply.

It is only when they are installing new levies and affecting new lands, new wetlands, that farmers come into 404 and need a permit. Much of the controversy that is arising is a result of the fact that we are just now in a situation where all four Federal agencies are working in a coordinated fashion, and we are seeing the growing pains of its implementation. Much of this controversy is going to be resolved with just a little bit of time. We are about half way through the wetlands delineation process in this country. We are now in a situation where half the country knows exactly what is required and what is not required. If we start exempting wetlands based on their size or their cropping history or because of mitigation, you might as well start throwing all those maps out the window and start over and go through the growing pains once again. I suggest strongly that we live through the current growing pains. We are almost through. Let's give it a chance.

On the small wetland exemption proposal—we think it is a very poor approach to resolving controversies with small wetlands. Any size you end up with to define a small wetland is going to be arbitrary, and you are going to run into things that are not equitable because you will have a farmer with a wetland slightly over the designated size that cannot convert, and a farmer with a wetland slightly under that size that is very valuable who can convert. Right now we have a process on the books that is called the minimal effect determination that is specifically designed to deal with small wetland controversies. We suggest that if this process is consistently implemented nationwide those small wetland concerns will disappear or at least be highly moderated.

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[11] See p. 664 for the prepared testimony of Ms. Williams.

Cropping history exemptions are probably the most pernicious of those that I have seen proposed by commodity groups. Most of the proposals that I have seen propose that croppings somewhere in the neighborhood of 5, 6 or 7 years out of 10 should exempt the wetland. Well, if that happens, we are looking anywhere in the neighborhood of between 17 and 22 million acres of wetlands in the continental United States that will be exempt from the provisions of swampbuster and could be drained. That is over 20 percent of the remaining wetlands, and we frankly cannot afford to lose that much.

CONCLUSION

My appeal to the committee at this point is that these issues need to be addressed head on, and they need to be tackled head on. Mr. Chairman, we would like very much to participate in negotiations and discussions with you on your bill. We have not to date and would like that opportunity. We certainly have been letting your office know of our concerns on these issues, but we really have not yet gotten down and seriously worked on anything. We do look to the committee to resolve these issues. We have great faith in the committee process and are anxious for it to begin. Thank you.

Senator **Fowler**. Thank you very much.

[The prepared statement [12] of Ms. Williams follows:]

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[12] The attachments to the prepared statement of Ms. Williams are retained in the subcommittee file. The attachments are: Farm Bill 1990—Agenda for the Environment and Consumers. Also memorandums on the subject matter of wetland protection and restoration recommendations for the conservation title of the 1990 farm bill.

Working for the Nature of Tomorrow

NATIONAL WILDLIFE FEDERATION

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STATEMENT OF

THE NATIONAL WILDLIFE FEDERATION

BEFORE

THE SENATE COMMITTEE ON AGRICULTURE, NUTRITION, AND FORESTRY

SUBCOMMITTEE ON CONSERVATION AND FORESTRY

ON

THE 1990 FARM BILL

CONSERVATION TITLE

MARCH 29, 1990

presented by

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REDUCING THE DETRIMENTAL ENVIRONMENTAL IMPACTS OF AGRICULTURE

Mr. Chairman and Members of the Committee, the National Wildlife Federation (NWF) appreciates the opportunity to provide the following statement on the impacts agriculture is having on our Nation's renewable natural resources and ways to begin reducing these impacts. Specifically, our comments focus on changes we believe necessary to improve the efficacy of Title XII of the Food Security Act of 1985 (FSA) in protecting fish and wildlife habitats.

In deliberating and debating the 1990 Farm Bill, Congress will establish American agricultural policy for the next one-half decade. It is our hope this policy will continue building on the linkage of environmental stewardship and agricultural operations first established in the 1985 FSA, and will be policy to carry us into the next century. The choices we make today will determine the long term health and sustainability of both the environment and American agriculture.

The impacts on the environment from conventional agriculture here in the United States have been enormous. Offsite impacts from sediment eroded from agricultural land causes billions of dollars damage to lakes and streams each year. USDA estimates that a staggering 1.6 billion tons of sediment are washed annually from agricultural lands into small streams. *U.S. Department of Agriculture, "The Second RCA Appraisal" (Washington, D.C., June 1989), p. 102.* A recent EPA inventory of water quality found 47 states in which agricultural runoff constituted a principal reason for waterways' inability to sustain such beneficial uses as swimming and fishing. *U.S. Environmental Protection Agency, "National Water Quality Inventory: 1986 Report to Congress" (Washington, D.C., November 1987), p.81.* The Conservation Foundation estimated $2.2 billion (1980 dollars) in annual sediment damages from cropland erosion alone, manifested primarily as lost recreational opportunities, flood damage, expenditures to dredge sediment from waterways, and damages to water treatment plants. *Edwin H. Clark II et al., "Eroding Soils: The Off-Farm Impacts" (The Conservation Foundation, Washington, D.C., 1985), p. 175.*

Fertilizer and pesticide runoff cause still more damage to fish, wildlife and water supplies. One-half to three-fourths of the nutrients reaching the Nation's surface waters derive from agricultural fertilizers and livestock waste. *National Research Council, "Alternative Agriculture", p. 99.* This nutrient pollution accelerates the process of eutrophication, robbing water of its life sustaining oxygen. Pesticide pollution of surface waters also is increasing. Researchers at the U.S. Geological Survey detected pesticides, often in excess of federal health advisory levels, in 90% of the streams they tested in 10 midwestern states during 1989. *U.S. Geological Survey, "Reconnaissance Sampling Finds Herbicides in Streams in Ten Midwestern States" (Washington, D.C., November 15. 1989), p. 2.*

Pesticide contamination not only causes problems for fish and wildlife, but also can affect municipal drinking water supplies. For one, pesticides were detected in 61% of surface water samples (that had been treated prior to analysis) recently examined by the Iowa Department of Natural Resources. For another, agricultural drain water in 18 locations appears to contain harmful concentrations of naturally-occurring trace elements that threatened to repeat the deformities and deaths of migratory birds in California's San Joaquin Valley. *National Research Council, "Irrigation-Induced Water Quality Problems" (National Academy Press, Washington, D.C., 1989), p. 31.*

Pesticides also find their way into the groundwater supplies of our Nation. By 1988, EPA had identified 46 agricultural pesticides in the groundwater of 26 states. *George R. Hallberg, "Pesticide Pollution of Groundwater in the Humid United States," Agriculture, Ecosystems and Environment, Vol. 26 (1989), p. 299.* Concern over this contamination is shared by rural and urban Americans alike, and it is growing. For example, The Food Marketing Institute reports that consumer concern over pesticides grew to over 82% last year. In a 1989 survey of rural residents by Rural Voice, 73% of those queried thought government was regulating pesticides inadequately. Farmers are concerned over elevated risks they face of contracting cancers of the lymph and blood systems, stomach, prostate, brain, lip, skin, and connective tissue. *Aaron Blair,* *"Cancer Risks Associated With Agriculture: Epidemiologic Evidence", Genetic Toxicology, eds., R.A. Fleck and A. Hollander. Plenum Publishing, 1982, pp. 93-111.* As well, studies conducted by the National Cancer Institute show higher incidence of cancer for farmers in Wisconsin, Nebraska, Iowa, Illinois, Washington, California, and Kansas than for the general population. *Aaron Blair, M.S. Hans-Malker, Kenneth P. Cantor, Leon Burmeister, Kerstin Wiklund, "Cancer Among Farmers," Scand J. Work Environ. Health. 11(1985), pp. 397-497; L.F. Burneister, GD, S.F. VanLier, P. Isacson, "Selected Cancer Mortality and Farm Practices in Iowa," Am. J. Epidemiol. 118(1983), pp. 72-77; D.P.Buesching and L. Wollstadt, "Cancer Among Farmers," J. Natl. Cancer Inst. 72(1984), p. 503 et seq.*

Additionally, over half the Nation's wetlands have been destroyed since our ancestors settled, and over 80% of these losses is attributable to agriculture. *W.E. Frayer et al., "Status and Trends of Wetlands and Deepwater Habitats in the Coterminous United States, 1950s to 1970s" (Colorado State University, Fort Collins, Colorado, 1983), p. 3.* According to the most recent estimates, wetlands are disappearing at a rate of 300,000 to 500,000 acres each year -- the equivalent of 34 to 57 acres an hour, 365 days a year.

On February 6, 1990, the NWF, and 10 consumer and conservation organizations released "Farm Bill 1990: Agenda For The Environment And Consumers". This document, a copy of which is appended to this testimony, set out a series of proposals for the 1990 Farm Bill to ensure that it provides the environmental policy underpinnings that American taxpayers so strongly desire. The recommendations of our organizations reflect not only the interests and concerns of conservationists and consumers, but also closely mirror those held by the majority of America's farmers. We are firmly convinced that, to protect our Nation's abundant natural resource heritage, the agricultural community must play a much greater and responsible role in husbanding America's soil, air, and water. Quite simply, it can no longer be "business as usual" down on the farm, but a time for rekindled and renewed commitment to the stewardship of these resources. The keystone of such a commitment is the Conservation Title of the 1990 Farm Bill.

SUMMARY OF WETLAND TESTIMONY

In 1985, Congress revolutionized farm legislation by incorporating wetland conservation provisions into Title XII of the 1985 FSA. Subtitle C of the FSA, commonly referred to as "Swampbuster," withholds a wide range of agricultural subsidies from farmers who convert wetlands and plant them to a commodity crop. The intent of Congress in passing Swampbuster was to deter wetland drainage while reducing the Nation's surplus of agricultural commodities.

Although considered an innovative and constructive approach to protecting our dwindling wetland resources, quite simply, Swampbuster has failed to live up to expectations. Unforeseen loopholes in the statute coupled with unenthusiastic implementation and enforcement have completely undermined the effectiveness of Swampbuster. If Swampbuster is to contribute meaningfully to achieving the President's goal of no net loss of wetlands, then major changes must be made to the law in the 1990 Farm Bill.

Specifically, the National Wildlife Federation recommends Congress enact the following amendments to Swampbuster:

- The act of converting a wetland, regardless of whether a commodity crop is planted to that wetland, must be a violation of the law;
- A wider range of federal subsidies than those currently withheld should be lost to producers who violate Swampbuster;

- Swampbuster should encourage greater involvement and participation by the public; and

- The administrative role of the Agricultural Stabilization and Conservation Service county committees should be reduced or eliminated.

WETLANDS MUST RECEIVE GREATER PROTECTION

On December 23, 1985 Congress passed the Swampbuster of the 1985 FSA. In so doing it took a dramatic and much needed step to better protect our Nation's remaining wetlands by declaring that America's taxpayers no longer would fuel the destruction of wetlands through agricultural subsidies. As it begins debating the 1990 Farm Bill, Congress must now "fine-tune" Swampbuster if it is to fulfill its original intent of protecting America's wetlands.

Since Swampbuster's enactment in 1985, the NWF has actively monitored its implementation and enforcement. Five years later we, along with government agencies and private citizens, have concluded the following:

1. Despite Swampbuster and other environmental laws, wetlands on agricultural lands continue to be destroyed through drainage, dredging, excavation, and clearing of wetland vegetation.

2. Swampbuster does not adequately protect wetlands from conversion to agriculture.

3. Swampbuster is not being implemented by the government in a fair, equitable manner.

4. Swampbuster must be substantively improved and strengthened if it indeed is going to thwart the continued drainage and conversion of wetlands to agriculture.

WETLANDS ARE VULNERABLE TO AGRICULTURAL CONVERSION

Less than half of the Nation's original 215 million acres of wetlands remain and, according to the most recent estimates, they are disappearing at a rate of 300,000 to 500,000 acres each year -- the equivalent of 34 to 57 acres an hour, 365 days a year. Historically, the primary cause of wetland losses in the United States has been their conversion to agricultural use. Over 80% of the wetlands acreage lost between the mid-1950s and the mid-1970s are attributable to agricultural drainage or clearing. In the last 40 years, approximately 16 million acres of wetlands have been converted to agricultural use.

Despite enactment of Swampbuster more than five years ago wetlands continue to be converted to agricultural purposes today. By October 16, 1989, the Soil Conservation Service had made wetland determinations on approximately 25% of the farms that receive federal farm support payments. Of these, 3,743 wetlands, representing a total of 77,260 acres, have been identified as being converted since Swampbuster was enacted in 1985. *1989 SCS Food Security Act Progress Report.* Extrapolating these data to the remaining 75% of wetlands held by producers who receive farm support payments, then over 300,000 wetlands acres have been converted since the passage of Swampbuster. Moreover, this estimate does not include wetlands drained by producers not enrolled in federal farm benefit programs. Clearly, Swampbuster is not deterring the conversion and destruction of our Nation's wetlands.

It is estimated that up to 70 million of the remaining 90 to 95 million wetland acres in the continental United States are vulnerable to agricultural conversion. [See the Soil Conservation Service's (SCS) 1982 Natural Resources Inventory (NRI) and the

U.S. Department of Agriculture's 1986 Environmental Assessment for the Wetland Conservation Provisions of the Food Security Act of 1985 (USDA EA): Of an estimated 95 million wetland acres remaining in the lower 48 states, approximately 70 million acres of wetlands in private ownership are potentially subject to agricultural conversion.] Approximately 80% of wetlands not federally protected are privately owned and, of these, palustrine wetlands are the most vulnerable to conversion. According to the NRI, of the 70.7 million acres of nonfederal palustrine wetlands remaining, 5.1 million acres have a moderate to high potential for conversion to cropland. According to Heimlich and Langner, about 85% of these 5.1 million wetland acres could be easily brought into production. *"Swampbusting in Perspective," 41 Journal of Soil and Water Conservation (No. 4) 219 (1986).*

Heimlich and Langner also estimate approximately 16 million acres of wetlands remaining in 1982 would earn short-term returns if converted, assuming 1985 crop prices and subsidy program participation rates. *"Swampbusting: Wetland Conversion and Farm Programs," USDA Ag. Econ. Rep. No. 551 (1986); "Swampbuster in Perspective," pp. 220-221.* Therefore, the 5.1 million acre estimate of wetlands with a high or medium potential for agricultural conversion identified by the NRI is probably overly-conservative and underestimates the wetland acreage that actually is vulnerable to conversion.

WETLANDS VULNERABLE TO AGRICULTURAL CONVERSION PROVIDE ENORMOUS PUBLIC BENEFITS

In 1984, the U.S. Fish and Wildlife Service (FWS) identified nine types of wetlands in the United States "that are in great jeopardy from a national standpoint". *U.S. Fish and Wildlife Service, Wetlands of the United States: Current Status and Recent Trends 31 (1984) ("Wetlands Status and Trends") pp. 35-36.* Agricultural conversion is a major threat to six of these nine types, and include the Prairie Potholes of the Dakotas, Montana, and Minnesota, the Lower Mississippi River Bottomlands, the palustrine wetlands of South Florida, the Nebraska Sandhills and Rainwater Basin, the pocosins of the North Carolina coastal plain, and Western riparian wetlands. *Swampbusting in Perspective, pp. 223-224.* All six wetland types provide enormous benefits to the American public.

The Prairie Pothole Wetlands

The prairie potholes of the Dakotas, Nebraska, Minnesota, Montana, and Iowa are vital to the recharge of groundwater aquifers in the region. *Hubbard and Linder, "Spring Runoff Retention in Prairie Pothole Wetlands," 41 Journal of Soil and Water Conservation (No.2) 122 (1986).* One study in northeastern South Dakota estimated that 213 wetlands produced a total minimum recharge of about 12 acre-feet in a 1,602-acre area. This recharge volume could irrigate 160 acres with 1.4 inches of water, or supply water for 1,699 head of cattle each year. *Id.*

Because prairie wetlands are hydraulically connected to the water table, their drainage can cause declines in the elevation of local water tables. *Id.* If these wetlands are not drained, then the converse holds true. Thus prairie potholes can be critical "savings banks" for groundwater when drought strikes, as it often has in the Dakotas, with its vicious effects on agriculture. *Brun, et al, "Stream Flow Changes in the Southern Red River Valley of North Dakota," 38 North Dakota Farm Research Bimonthly Bull. (No.5) 11 (1981) ("Stream Flow Changes in Red River Valley").*

Flooding also is a major problem in the Dakotas and often can lead to total destruction of crops, and bridges, cause damage to homes and businesses, and erode valuable soils. For example, in Enderlin, North Dakota, major sections of the town have been abandoned due to the repeated flooding that has plagued the community over the past 25 years. *Stream Flow Changes in Red River Valley, p.11.* Drainage of wetlands that would otherwise store excess water is one of the factors that has contributed to the unprecedented flooding history of this town in the Southern Red River Valley in North Dakota. *Id.;* and *Ludden, et al., "Water Storage Capacity of*

Natural Wetland Depressions in the Devils Lake Basin of North Dakota," 38 Journal of Soil and Water Conservation (No. 1) 45 (1983). While climate plays a major role in the timing and degree of flooding, prairie pothole wetlands play a significant role in reducing flood flows.

In addition to absorbing storm runoff, prairie pothole wetlands also store spring snow melt and thereby help moderate spring flooding. The 213 small wetlands in the South Dakota study discussed above retained a minimum of 158.7 acre-feet of water during the spring thaw. Drainage of these wetlands therefore, would obviously contribute to downstream flood events in the watershed under certain conditions. *Id.* Prairie potholes in the Devils Lake Basin of North Dakota are estimated to have a storage capacity of 657,000 acre-feet and can retain 72% of the total runoff of a two-year event. These potholes would retain almost half of the total runoff of a 100 year event, thus drainage of these wetlands could significantly exacerbate downstream flooding in the Devils Lake Basin.

Despite their water retention capacities, the prairie potholes are perhaps best known as America's "duck factory". According to the Fish and Wildlife Service's *"Wetlands Status and Trends"*, Prairie potholes are the most valuable inland marshes for the waterfowl production in North America. While the prairie pothole region comprises only 10% of North America's waterfowl breeding area, it produces 50% or more of the continent's ducks. *Id.* Almost 90% of the ducks breeding in the lower 48 states do so in the Dakotas, Minnesota and Montana. *Wittmier, "Prairie Potholes: Can we Save Them From the Plow?," 50 Outdoor America (No.4), p.9 (1985) ("Can We Save Potholes?").* When drought strikes Canadian Waterfowl breeding areas, prairie potholes in the United States, especially those in North Dakota, can be crucial to maintaining the continental waterfowl population.

Smaller, shallower potholes -- the ones most vulnerable to agricultural conversion -- are critical to breeding of waterfowl pairs because these wetlands thaw early in the spring and provide abundant invertebrates and aquatic plants which are vital foods for the waterfowl. The large number of these small, isolated wetlands also facilitates waterfowl production by permitting breeding pairs to disperse and establish territory as well as by reducing the risk of disease which increases as waterfowl are concentrated on ever-reduced habitat. *Wetlands Status and Trends, p. 43; can We Save Potholes?, p. 9.; Linder and Hubbard, "Wetland Values in the Prairie Pothole Region of North America," in Proceedings of Great Plains Agricultural Council (1982).* Although isolated wetlands in the prairie potholes may hold water for only a short time each year, that period is critical to migrating ducks for resting and for breeding. *U.S. Fish and Wildlife Service, "Wetland Resource North Dakota" (unpubl.).*

In 1985, it was estimated that migratory bird hunters spent in excess of $1 billion. *U.S. Fish and Wildlife Service, 1985 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, p. 68.* Birds produced on the prairie potholes are highly valued by an estimated 2 million sportsman and countless thousands of bird watchers found in every state of the Union. Despite the nationwide "love affair" with migratory birds, duck populations have crashed to their lowest levels in recorded history. The reason, according to FWS, is simple: loss of habitat. *U.S. Fish and Wildlife Service, A National Waterfowl Management Plan for the United States 5 (1982).* The loss of waterfowl habitat in the United States precipitating this decline is directly attributable to the continued agricultural conversion of the Nation's prairie pothole wetlands.

Despite the importance of prairie pothole wetlands, they continue to be drained at a rate of 20,000 acres per year. *Department of Interior, "The Impact of Federal Programs on Wetlands," (Volume 1) 80 (1988) (DOI Report).* According to the FWS's National Wetlands Inventory, the prairie pothole region retains only 5.3 million of its original 17 million wetlands acres. Most of this wetland destruction was caused by conversion to farming, *Wetland Status and Trends, p. 42*, and almost 600,000 wetland acres in this region still have a moderate to high potential for conversion to agriculture. *Swampbusting in Perspective, p.223.*

The Lower Mississippi River Valley Bottomlands

The bottomland hardwood forests of the Lower Mississippi River Valley are forested wetlands characterized by black gum, bald cypress, and several species of water-tolerant oaks and hickories. These systems are extremely valuable and productive fish and wildlife habitats.

Bottomland hardwood forests provide numerous functions. They are effective nutrient filters, and are particularly efficient in converting inorganic nitrogen and phosphorus to organic forms. These nutrients are absorbed in bottomland soils and taken up by forest vegetation. *Harris and Gosselink (1988).* Bottomland hardwood wetlands also can remove toxic substances, such as residuals from pesticides, heavy metals, and chlorinated hydrocarbons from stream flows. This removal probably occurs by adsorption of toxicants onto suspended sediments, followed by their incorporation and stabilization in the sediment. *Office of Technology Assessment, Wetlands: Their Use and Regulation 108 (1984) (OTA Report); Wetlands Status and Trends, p. 18.* The filtering function of bottomland hardwood systems is particularly important in light of the high rate of their conversion to agriculture -- primarily for soybean production -- and the concomitant increase in agricultural loading of waters in the Lower Mississippi River Valley.

Bottomland hardwoods can also be an important deterrent to soil erosion and thus conserve soil as well as enhance water quality. These wetlands reduce water velocity and retain soil in two primary ways: First, the broad floodplain, characteristic of these systems, creates meanders and allows periodic overbank flooding, which in turn allows greater area for water to disperse. Second, vegetation helps reduce water velocity, thereby allowing sediments to be deposited more rapidly and to help anchor these sediments once they are no longer suspended. *Harris, et al. (1984).*

Bottomland hardwood forests also provide flood storage capacity and modify storm flows by temporarily detaining surface waters, recharging aquifers, and reducing flood water velocities. *Id.* They may also store groundwater and contribute baseflow to streams during dry periods. *Brinson, et al., "Riparian Ecosystems: Their Ecology and Status," (1981).* Numerous studies have shown lowered flood hydrograph peaks are closely correlated to healthy, functioning bottomland hardwood floodplains. *Harris and Gosselink (1986).*

Bottomland hardwoods are used extensively by migrating waterfowl for staging and overwintering areas. According to the Department of Interior, 2.5 to 3.0 million mallards and almost the Nation's entire wood duck population -- 4 million birds -- use these wetlands as critical overwintering habitat. *DOI Report at 39.*

Bottomland hardwoods's provide important habitats for mink, otter, and beaver, as well. Indeed, the Bottomlands of Louisiana produce the largest annual fur harvest in the Nation, fully 65% of all U.S. production. *Harris and Gosselink, "Cumulative Impacts of Bottomland Hardwood Conversion on Hydrology, Water Quality, and Terrestrial Wildlife," (1986) (unpubl. report).* Flooded bottomlands also provide important fish spawning and feeding habitat and support some of the highest fish populations of any habitat. *Harris, et al., "Bottomland Hardwoods: Valuable, Vanishing, Vulnerable," (1984).*

Only about 20%, or approximately 4-5 million acres, of the Nation's original bottomland hardwood wetlands remain (*DOI Report at 39)*, and, in fact, this wetland type is one of the most rapidly diminishing in the United States. Current annual loss rate are estimated to be 2%, or in excess of 100,000 acres. *Id.* In 1982, the National Research Council predicted that the most extensive wetland losses in the U.S. would continue to be in the bottomland hardwoods, with another 1.5 million acres of bottomland hardwood wetlands expected to be lost by 1995. Of the approximately 4.3 million acres of nonfederal bottomland hardwood wetlands, approximately 387,000 (9%) are considered to have a moderate to high potential for conversion. *Heimlich and Langner (1986).*

South Florida Palustrine Wetlands

South Florida's palustrine wetlands provide freshwaters which are maintaining the salinity balance in coastal estuaries. These esturaine systems, in turn, support 85% of Florida's coastal marine fishery, provide breeding and wintering habitat for many bird species, and support a host of federally-listed endangered species. *Wetland Status and Trends, pp. 40-41.* Agricultural conversion and projects to protect agricultural lands from flooding have been major factors in fueling the loss of this region's wetlands base. According to the NRI, approximately 382,500 (8.5%) of South Florida Palustrine wetland acreage that is not in federal ownership has a moderate to high potential for conversion to agriculture. *Swampbusting in Perspective, p. 223.*

Nebraska's Sandhills and Rainwater Basin

Nebraska's Sandhills and Rainwater Basin wetlands are critical migratory habitats for waterfowl and sandhill cranes in the Central Flyway. *Wetland Status and Trends, pp. 46-48.* Agricultural conversion of these areas has been acute and coupled with broad scale irrigation projects, losses of the region's wetlands have concentrated migratory birds into smaller and smaller areas, resulting in increased incidence of disease. *Id.* Approximately 130,000 acres of wetlands in the Nebraska Sandhills and Rainwater Basin are estimated to have a moderate to high potential for conversion to agriculture. *Swampbusting in Perspective, p.223.*

North Carolina Pocosin Wetlands

North Carolina Pocosin wetlands are principal groundwater recharge areas, and, similar to South Florida's wetlands, provide fresh water runoff essential to maintaining the salinity balance of its coastal estuaries. Pocosin wetlands also provide important fish and wildlife habitats. *Wetland Status and Trends, pp. 49-50.* The SCS has estimated that approximately 380,000 acres of North Carolina's Pocosin wetlands have a moderate to high potential for agricultural conversion. However, these conversions may be profitable on a much larger number of acres due to economies of scale which favor large-acreage wetland conversions in Pocosin. *Swampbusting in Perspective, p. 223.*

Western Riparian Wetlands

Western riparian wetlands are literally islands of green in an arid environment that provide important food and cover for resident and migratory species of fish and wildlife. *Wetland Status and Trends, pp. 50-51.* These areas have been reduced significantly from their original size, due in large part to agricultural conversion. *Id.*, Approximately 35,000 acres of riparian wetlands have a moderate to high potential to be converted to agriculture. *Swampbusting in Perspective, pp. 223-224.*

WHAT IS SWAMPBUSTER?

On December 23, 1985, President Reagan signed the Food Security Act of 1985. The wetland conservation provisions of the statute, now commonly referred to as "Swampbuster," reflected an increased awareness by Congress of the tremendous societal values that wetlands provide and the growing public concern over the continued loss of the Nation's wetland resources. The overarching intent of Swampbuster is to remove federal financial incentives to convert wetlands and thus, reduce the production of surplus commodity crops on these environmentally-sensitive lands. Among the other benefits to be derived from Swampbuster are the *[Highly Erodible Land and Wetland Conservation, 7 C.F.R. section 12.1 (1989)]*:

- Reduction of soil loss due to wind and water erosion;
- Protection of the Nation's long-term capability to produce food and fiber;
- Reduction of sedimentation and improvement water quality; and
- Curtailment of over production of surplus commodities.

In passing Swampbuster, Congress realized that discouraging individuals from converting wetland areas to cropland would serve the twin goals of bolstering commodity prices and preserving a natural resource with a multitude of public values.

Swampbuster provides that anyone who, after December 23, 1985, produces an agricultural commodity crop on a converted wetland shall be determined to be ineligible for certain benefits provided by the U.S. Department of Agriculture and agencies of the Department. These benefits may include:

- Any type of price support or payment made available under the Agricultural Act of 1949;
- Farm storage facility loans made available under the CCC Charter Act;
- Disaster payments made available under the Agricultural Act of 1949;
- Crop insurance made available under the Federal Crop Insurance Act;
- Farm loans made, insured or guaranteed by the FmHA; and
- Payment for storage of an agricultural commodity pursuant to the CCC Charter Act.

Swampbuster is administered by the U.S. Department of Agriculture. The Agricultural Stabilization and Conservation Service (ASCS), a branch of the USDA, is vested with the primary responsibility for implementing and enforcing the statute. Swampbuster implementation and enforcement is supervised by the ASCS administrator and implemented and enforced in the field by state and county ASCS committees. In theory, these county committees are to issue unbiased Swampbuster decisions that affect a producer's eligibility for receiving farm program benefits by determining:

- Whether an individual produced an agricultural commodity on an area that was a converted wetland;
- Whether the agricultural commodity produced was planted prior to December 23, 1985 or during any crop year before December 23, 1985; and
- Whether the conversion of the wetland on which the agricultural commodity was produced "commenced" prior to December 23, 1985.

The ASCS is also authorized to conduct random compliance spot checks and to issue exemptions from Swampbuster as set out in the final rules promulgated pursuant to the 1985 Food and Security Act.

The Soil Conservation Service (SCS), Farmers Home Administration (FmHA), and the U.S. Fish and Wildlife Service (USFWS) also have a role in the administration of Swampbuster. Specifically, the SCS is responsible for making wetland determinations, authorizing certain exemptions to Swampbuster and making other technical determinations; FmHA ensures that loan proceeds will not contribute to the conversion of wetlands to croplands; and the USFWS consults with both ASCS and SCS on wetland determinations and exemptions.

Swampbuster Is Sound Fiscal Policy

In the past decade, USDA has provided in excess of $200 billion dollars in farm program benefits to producers. These massive financial outlays, which amount to approximately $25 billion dollars a year, are paid out directly by America's taxpayers. Said differently, the federal government has spent the equivalent of more than $500,000 on every full-time U.S. farmer since 1980. So significant are these payments, that the annual subsidies for American farmers exceeds the per capita income for much of the world's population.

Many of the farmer's profits are tied directly to farm subsidy programs. Because a farmer's subsidies are determined by how many acres of subsidized crops were planted in a previous year, farmers could convert wetlands prior to passage of the 1985 FSA to increase the acreage on which they qualify for federal payments not to plant a crop in the future. Therefore, wetland conversions and federal crop supports were directly linked. Although this incentive was to have been removed by Congress in passing the 1985 Food Security Act, as discussed below, the job is not complete.

As American taxpayers continue pouring millions of dollars into the farm community, rampant wetland destruction for agricultural purposes continues at the expense of the public and the many significant public values derived from wetlands. Monetary values of wetlands can be measured in terms of the consumptive and nonconsumptive recreational activities they support. Waterfowl, which are inextricably dependent on wetlands, are money in the bank. For example, a 1985 survey by the USFWS estimated that over $1 billion was spent by hunters pursuing migratory birds. *U.S. Fish and Wildlife Service, 1985 National Survey of Fishing, Hunting, and Wildlife Associated Recreation, p. 68.* Studies in South Dakota document that the state's resident hunters spent in excess of $24 million in 1982. This same study also estimated that the total consumers surplus (a measure of the benefits received in excess of costs paid; i.e., the amount the hunter perceived to be the value of his hunting experience) was almost $34 million. In North Dakota, Sorenson (1975) estimated that of the $54.3 million generated by hunter expenditures, 65%, or $30.4 million, could be attributed to the services provided by, and derived from, wetlands. *U.S. Fish and Wildlife Service, Glaciated Prairie Wetland Functions and Values: A Synthesis of the Literature, p. 31.*

The continued conversion of wetlands to agriculture is simply bad fiscal policy. Congress alone represents the fiduciary interest of the Nation, therefore Congress must put a stop to spending more federal tax dollars and fueling the continued destruction of our wetlands. Sound fiscal policy not only mandates the retention of Swampbuster, but it mandates its strengthening as well. The alternative will be to deprive the federal and state governments of needed revenues and to deprive the American public of the many economic and ecological benefits derived from wetlands.

SWAMPBUSTER IN PRACTICE

The 1985 Swampbuster Provisions Have Loopholes and Limitations

As a wetlands protection statute, Swampbuster has several critical limitations. First, it does not penalize a farmer for draining or otherwise manipulating a wetland. The producer only risks losing benefits in those years when he or she actually plants a commodity crop on the converted wetland. While on its surface the cropping requirement in current law is seemingly an effective deterrent, in practice it actually diminishes the producer's incentive to preserve wetlands. This is because a farmer can convert wetlands on his property and then plant crops in only those years when commodity prices are high enough to sustain losses from withheld subsidy payments or in years when he or she does not intend to apply for agricultural subsidies. In years the farmer choses to receive program subsidies, the converted wetlands can be hayed without the loss of benefits.

Besides the obvious weakness this loophole creates in promoting greater wetlands protection, it also makes Swampbuster more difficult for federal agencies and farmers to monitor in the field. While ASCS, SCS, or USFWS field personnel may be likely to observe and report new drainage activity, they simply do not have the resources necessary to review wetlands converted in earlier years to determine whether these areas have been planted to a commodity crop. Similarly, farmers may not always have the resources needed to ensure his or her workers follow directions not to plant commodity crops on wetlands converted in previous years and thus jeopardize farm program benefits.

Second, Swampbuster discourages only those farmers who participate indesignated federal farm programs from converting wetlands . Farming operations that do not produce crops with commodity crop price supports, or that do not rely on federally subsidized loans or insurance programs, can ignore Swampbuster altogether. Thus, Swampbuster can be an effective deterrent to wetlands drainage in only those areas where participation in farm programs is high and where subsidies contribute significantly to farm income or profitability.

Finally, Swampbuster fails to expressly provide an administrative appeals mechanism for individuals who are not farmers. In current law, Swampbuster directs the Secretary of Agriculture to promulgate regulations under which a "person who is adversely affected by any determination" may seek review. Despite the fact that many individuals may be "adversely affected" by drainage of wetlands, the USDA's final regulations limit administrative review to producers who have been, or will be, denied benefits as a result of a Swampbuster determination. Therefore, only decisions that favor wetlands protection can be reconsidered and reversed through the current appeals process. Swampbuster must be amended to provide a formal mechanism for challenging decisions that is available to all adversely affected individuals and could be used to appeal bad decisions, whether they favor a producer or wetland protection.

Swampbuster Is Ineffectively Implemented and Enforced

In April 1989, the ASCS reported ~~that 427~~ producers had been penalized a total of $843,264.65 as a result of Swampbuster violations. *Sod/Swamp Cumulative Data Report (March/April 1989).* This report by the ASCS led Secretary of Agriculture, Clayton Yuetter, to declare that the USDA has "actively implemented" the Swampbuster provisions of the 1985 Food Security Act. Despite the claims by the ASCS and Secretary Yuetter that all is well, the stark reality is that Swampbuster has not been effectively administered. The USDA's glowing assessment of Swampbuster was based on faulty information and must not divert Congress' attention from the fact that Swampbuster is not being enforced in the manner intended by the Nation's lawmakers.

A recent study demonstrates that the ASCS's April, 1989 figures are inaccurate and greatly embellish the extent of that agency's enforcement of Swampbuster. A detailed analysis conducted by the NWF's Prairie Wetlands Resource Center, determined only 26 producers in the entire United States lost benefits as a result of Swampbuster violations occurring between December 23, 1985 and April 15, 1989. Moreover, the total amount of benefits forfeited by these producers was a mere $123,795.42. In fact, not a single dollar was withheld from a single producer in the Pacific Flyway, the gulf coast, or the South and only six states actually withheld agricultural subsidies as a result of Swampbuster violations. Lest one jump to the conclusion that this demonstrates a high rate of compliance with Swampbuster, the fact remains that more than one million acres of wetlands were destroyed (primarily as a result of agricultural conversions) in the three and one-half years since the Food Service Act was signed into law. According to a check of a very small percentage of farms by the SCS, at least 3,743 wetlands, amounting to 77,260 acres were known to have been converted during this period. *1989 SCS Food Security Act Progress Report.* Meanwhile, the USDA delivered more than $90 billion in subsidy payments to farmers. Clearly, unless Congress and the agencies change the way Swampbuster is written, producers will continue to line their pockets with federal subsidies paid by American taxpayers and our Nation's wetlands will continue to disappear.

Illegal exemptions to Swampbuster, granted by the ASCS, are proving to be the Achilles' heel of the statute and the greatest single source of administrative abuse. For instance, almost 90% of the 5,000 commercial determination exemptions filed with ASCS have been granted by the agency. *Sod/Swamp Cumulative Data Report*. Information received and reviewed by the NWF in response to more than 100 Freedom of Information Act requests reveals that relatively few of these exemptions were warranted under Swampbuster and its implementing regulations. This conclusion is buttressed by a nationwide reevaluation of the commended determinations granted by the ASCS. Review boards, comprised of personnel from the Department of Agriculture and the Department of Interior, have been ordered by ASCS Administrator, Keith Bjerke, to reconsider the exemptions. In Minnesota, where approximately 600 commenced determinations are presently being reviewed, the U.S. Fish and Wildlife Service estimates that more than 50% of these determinations will be invalid. *Eric Nelson, personal communication*. If the results apply to other states, then thousands of exemptions will have to be reversed by the ASCS.

One example of the arbitrary decision-making that has plagued Swampbuster involves the White Spur drainage project in Bottineau County, North Dakota. Although the water resource district had not completed its drainage plans, moved a single spade of dirt, or even executed a construction contract, the ASCS determined that the project was commenced prior to the enactment of Swampbuster and was therefore entitled to an exemption. The ASCS's decision, opposed by the U.S. Fish and Wildlife Service, the NWF, and the majority of farmers in the region, applies to an assessment area of 139 square miles and exempts 6,500 acres of prairie wetlands from the protection of Swampbuster. Despite overwhelming evidence that the commenced determination was an improper one, the ASCS to this day refuses to reverse its decision. Because of this, the NWF has been forced to file suit against the agency in federal district court seeking a reversal of the ASCS determination.

In those rare instances when the ASCS concedes that a producer is ineligible for an exemption, the agency still attempts to avoid enforcing the law. In the case of Minnesota's Yellow Medicine River Watershed District Ditch 18 (Ditch 18), the ASCS was persuaded to revoke a commenced determination, but only after the U.S. Fish and Wildlife Service, the Minnesota Department of Natural Resources, and the NWF demonstrated that the project failed to meet the legal prerequisites for an exemption. Nevertheless, the agency bowed to political pressure and elected to treat the project as if it were exempt from Swampbuster, arguing that Ditch 18 had been built in reliance on the original, albeit erroneous, exemption decision. In doing so, ASCS failed to acknowledge the abundant evidence accumulated establishing that the water resource district knew the exemption was invalid, knew the commenced determination was likely to be reversed, but still chose to proceed with the wetland drainage project anyway. Again, the NWF has been forced to sue the ASCS in federal district court to rectify this situation.

The NWF is not alone in faulting the implementation of Swampbuster. The Soil and Water Conservation Society (SWCS) recently completed the first part of a nationwide study of the Conservation Title of the Food Security Act. The SWCS concluded, inter alia, that while Swampbuster has, to a certain extent, slowed the conversion of wetlands, violations continue to occur. *Soil and Water Conservation Society, Implementing the Conservation Title of the Food Security Act p. 8 (1990).* Notably, the study acknowledged that "there seems little doubt that [ASCS] county committees were lenient in granting commenced exemptions." *Soil and Water Conservation Society at 42.* Widespread criticism of USDA's administration of Swampbuster has also precipitated an audit by the Inspector General, an investigation by the General Accounting Office, and a study by the Environmental Protection Agency.

Ineffective enforcement of Swampbuster is due primarily to the organizational structure of the ASCS, which places the responsibility for implementing Swampbuster in the hands of locally-elected county committees. These committees make most of the day-to-day decisions under Swampbuster and ultimately determine a producer's eligibility for farm program benefits. Not surprisingly, county committees have been both unwilling and unable to properly administer Swampbuster.

The ASCS county committee structure is unsuitable for the important task of implementing Swampbuster for the following reasons:

o Agency Bias. The ASCS was created to assist farmers. Its employees are knowledgeable about agriculture and sympathetic to the agricultural community. County committees are thus reluctant to penalize farmers for the sake of poorly understood environmental values.

o Personal Bias. To be eligible to become a committee member, an individual must be a resident farmer of the county in which he or she is to serve. Only farmers residing in the community are entitled to vote in the elections in which committee members are selected. As a result, county committee members are frequently put into the difficult position of rendering a decision which may harm friends or neighbors. Moreover, because committee members themselves are part of the regulated community, they are often skeptical about strict enforcement of Swampbuster.

o Lack of Expertise in Wetland Issues. The ASCS has the responsibility of randomly spot checking farms to ensure that producers are in compliance with Swampbuster. Unfortunately, ASCS personnel have little, if any, expertise in recognizing wetlands or in determining the scope and effect of drainage systems.

o Lack of Accountability. County committee members are not professionals. They are elected to office for three year terms and earn less than $75 per month for their services. Most committee members are full-time farmers and, as a result, have little professional or financial incentive to enforce laws or regulations with which they disagree. Committee members are instead more concerned with maintaining their reputation within the agricultural community than they are with losing a part-time job and a nominal pay check.

AMENDMENTS ARE NEEDED IN THE 1990 FARM BILL

The Act of Converting a Wetland Must Be A Violation of Swampbuster

Swampbuster should be amended so that a violation occurs upon the conversion of a wetland, as opposed to when the converted wetland is planted with a commodity crop. A producer who converts a wetland should also be required to restore the converted wetland in order to regain eligibility for agricultural subsidies. Such an amendment to Section 1221 of the Food Security Act might be drafted as follows: "... any person who in any year drains, dredges, fills, levels, or otherwise converts a wetland shall be ineligible for [agricultural subsidies] until such time as the converted wetland is restored to its previous condition."

A Wider Range Of Federal Subsidies Should Be Withheld As A Result Of A Swampbuster Violation.

Swampbuster should be amended to make violators ineligible for all loans made, insured, or guaranteed by federally insured farm lending institutions rather than just those administered by the Farmers Home Administration. Moreover, a determination of ineligibility should not be dependent upon a finding that loan proceeds would actually be used to convert wetlands. This proposal is consistent with the policy that federal assistance should not directly or indirectly subsidize wetland drainage and would serve to deter wetland conversion in areas of the Nation where reliance on federal farm price supports is minimal.

Swampbuster Should Encourage Public Involvement

In light of the many public values of wetlands, and the billions of tax dollars that support the farm economy, Swampbuster should be amended to encourage and facilitate the participation of conservation organizations and other concerned citizens. Such an amendment should establish and encourage use of an effective procedure for reporting, recording, and following up on potential Swampbuster violations. Private citizens can provide a very effective and inexpensive means for enforcing the law.

In a similar vein, the law should unequivocally provide that hearings on Swampbuster compliance be made open to the public. In the past, individuals concerned with monitoring Swampbuster compliance have been denied access to ASCS committee meetings. In addition, Section 1243(a) of the Food Security Act should be clarified to expressly provide for a formal administrative appeal process that is available to nonproducers as well as to producers denied benefits. Simply put, the administering agencies must be held accountable to the taxpayers who ultimately make possible the Nation's agricultural subsidies.

The Administrative Role Of The ASCS County Committees Should Be Reduced Or Eliminated

The primary responsibility for administering Swampbuster should be transferred from the ASCS to the Fish and Wildlife Service. In contrast to the ASCS, the USFWS is ideally suited to administer Swampbuster. For one, the USFWS is already actively engaged in implementing Swampbuster and has designated farm bill coordinators in each state. On a local level, the USFWS's project leaders frequently investigate Swampbuster violations and fulfill the agency's statutory consulting role. For another, USFWS personnel are knowledgeable about wetland issues, have the necessary technical and scientific groundings, and are philosophically disposed to protect wetlands. Finally, because the USFWS does not suffer from the biases that characterize the ASCS county committees, the service could be expected to implement Swampbuster impartially and, to do so in full compliance with the law and the regulations.

At a minimum, the ASCS should be required to have USFWS concurrence before any Swampbuster exemption is granted. Although the SCS must first comply with such a requirement before granting minimal effects exemptions, the ASCS must only consult with the USFWS. In reality, this consultation does not always occur, and even when it does the USFWS's recommendations are often ignored. Requiring USFWS concurrence on all Swampbuster determinations would ensure that full wetlands and wildlife expertise is brought to bear in monitoring important decisions affecting the fate of wetlands and would lend outside objectivity to what have been less-than-impartial decisions to date.

Department of Agriculture's Wetland Conservation Analysis Team Recommends Amendments

It bears mentioning that the Department of Agriculture's Wetland Conservation Analysis Team has made similar recommendations for the Conservation Title of the 1990 Farm Bill. Comprised of representatives of the U.S. Fish and Wildlife Service, the Economic Research Team, the Soil Conservation Service, the Farmers Home Administration, the Agricultural Stabilization and Conservation Service, the Environmental Protection Agency, the Economic Analysis Staff, the Office of Budget and Program Analysis, and the Interior Department's Office of Policy, Budget and Administration, the Team has proposed strengthening the wetland conservation provisions by:

1. Amending Swampbuster so that a violation occurs upon manipulation or conversion;

2. Expanding the scope of federal benefits and assistance withheld as the result of a violation;

3. Reducing the role of the ASCS county committees by creating interagency Swampbuster boards to review exemption appeals and wetland appeals; and

4. Allowing third parties who have wetland conservation interests to appeal USDA determinations.

A copy of the Team's report and recommendations is appended to this testimony.

ATTEMPTS TO WEAKEN SWAMPBUSTER MUST BE REJECTED

For over three years now commodity groups and farmers have expressly advocated elimination of millions of acres of temporary and seasonal wetlands from the protective provisions of Swampbuster. The strategy for accomplishing this is to either: (1) exempt conversion of wetland of a size considered to be "diminimus" or (2) exempt all wetlands that have been recently cropped. These same parties have also proposed there be a carte blanche mitigation policy to further weaken Swampbuster. Whether based on size, cropping history, or mitigation, these strategies have the singular goal of eliminating significant portions of our Nation's wetlands from protection. These proposals are entirely out of step with public sentiment concerning wetlands and the Bush Administration's pledge for greater wetlands protection.

Exempting Wetlands Based On Cropping History Would Eliminate Protection for Millions of Wetland Acres

Cropped wetlands are an extremely common feature of the landscape in the prairie pothole region of the United States. These wetlands are extremely valuable for their hydrologic functions, as well as for the many benefits they provide wildlife. LaGrange and Dinsmore have documented the importance of seasonally flooded agricultural lands for mallard ducks during their migration. *LaGrange and Dinsmore, 1988, "Nutrient Reserve Dynamics of Female Mallards During Spring Migration Through Central Iowa", Pg. 287-297, in M.W. Weller ed., Waterfowl in Winter, University of Minnesota Press, Minneapolis.* Even in areas where few natural wetlands remain, the diversity of the remaining habitat types, including cropped wetlands, is critical to these birds.

Pintail ducks prefer shallow water (Smith 1968), and sparse low vegetation (Sowls 1955), characteristics commonly associated with cropped wetlands, and Kantrud and Stewart (1977) report usage of undifferentiated tillage ponds by pintails. *(Smith, 1986, "The Social Aspects of Reproductive Behavior on the Pintail, Auk 85:381-396; Sowls, L.K., 1955, Prairie Ducks, Wildlife Management Institute, Washington, DC;* and *Kantrud, H.A., and R.E. Stewart, 1977, Use of Natural Basin Wetlands by Breeding North Dakota, Journal of Wildlife Management, 41(2):243-253.)* Clearly, cropped wetlands containing weeds and stubble can provide important food sources for pintail hens *(Krapu, G.L, 1974, Foods of Breeding Pintails in North Dakota, Journal of Wildlife Management, 38(3):408-417.)*

In addition to the adverse impacts occurring to wildlife, widespread wetland drainage could also result in a loss of soil moisture needed for plant growth *(Hubbard, D.E., J.L. Richardson, and D.D. Malo, 1988 Glaciated Prairie Wetlands: Soils, Hydrology, and Land-use Implications, pp. 137-143 in J.A. Kusler and G. Brooks eds., Proceedings of the National Wetland Symposium: Wetlands Hydrology, Sept. 16-18,* *1987, Chicago, IL, Association of State Wetland Managers, Berne, NY).* Although much remains to be learned about how to quantify these values, many scientist believe that if wetland drainage continues in the prairie potholes the agricultural productivity of the area could decline dramatically (*Id*).

Because of the practice of cropping these areas during dry periods, applying a cropping history exemption to Swampbuster would eliminate protection for all temporary wetlands as well as for much of the seasonal and semi-permanent wetlands found throughout the prairie states. Since temporary and seasonal wetlands comprise a significant percentage of the wetlands in large agricultural states, a cropping exemption would be devastating. *Tom Dahl (USFWS-NWI) personal correspondence.*

STATE	ACRES	PERCENTAGE
North Dakota	1,699,740	71%
South Dakota	896,680	58%
Michigan	670,000	30%
Wisconsin	639,767	30%
Nebraska	609,760	40%
Minnesota	402,810	29%
Illinois	229,587	50%
Indiana	187,659	50%
Iowa	180,000	30%
Kansas	174,160	50%
Missouri	125,325	50%

Cropped wetlands represent a significant portion of the Nation's remaining wetland base, therefore, exempting wetlands cropped during six years between 1975 and

1985 could eliminate protection for 23%, or 22.8 million acres, of the remaining wetlands in United States. *(Soil Conservation Service, 1982, NRI.)* By exempting cropped wetlands, surplus agricultural production will be increased and growing numbers of valuable wetlands destroyed. These are precisely the situations that Swampbuster was enacted and designed to prevent and is exactly why such "exemption" proposals should be categorically rejected.

There are two additional reasons why any weakening changes made to Swampbuster would result in increased wetlands drainage. First, a change in the law to exempt whole categories of wetlands signals to agricultural producers and the Nation that Congress is not really serious about wetlands protection. Second, farmers are likely to drain any wetlands newly exempted from Swampbuster to ensure that such drainage will not be restricted in the future.

Exempting "Small" Wetlands from Swampbuster Would Result in Millions of Wetland Acres Being Removed From Protection

Proposals to exempt wetlands from Swampbuster based on their size is equally disingenuous. Within the last three years, the prairies have experienced a devastating drought and numerous wetlands throughout the region have been planted to crops. A significant number of these valuable and productive wetlands are less than one acre in size. The USFWS estimates that of the remaining 2,707,001 wetland basins remaining in the prairie pothole region, 683,153 wetlands are less than an acre in size. *U.S. Fish and Wildlife Service, "Status of Prairie Potholes in the United States".* Clearly, exempting wetlands based on a test of minimal size would effectively eliminate millions of wetlands from federal protection.

Biologically and hydrologically small wetlands are extremely valuable. For one, they are the backbone of waterfowl production. This is because small wetlands provide optimum habitat diversity that is essential to breeding waterfowl. For another, small wetland complexes provide for better groundwater recharge and better water retention than larger expanses of wetlands similar in size. Studies concluded recently have demonstrated the importance of small wetlands in recharging groundwater supplies and the important discharge role these areas serve *(Hubbard, D.E., 1988 Glaciated Prairie Wetland Functions and Values: A Synthesis of the Literature, US Fish and Wildlife Service Biol. Rep., 88(43). 50pp).*

Mitigation Is A Carte Blanche For Wetlands Destruction

Opponents to Swampbuster are proposing the use of mitigation as a way to offset wetlands converted to agriculture. This, despite an abundance of recent literature demonstrating that the science of wetland restoration/creation remains in its infancy and has numerous attendant problems and concerns. Simply put, there are insufficient scientific data to warrant the use of mitigation in Swampbuster in any manner. *(Kusler, J.A. and M.E. Kentula, 1989, Executive Summary, pp. xi-xix in J.A. Kusler and M.E. Kentula, eds. Wetland Creation and Restoration: The Status of the Science, USEPA 600/3-89/038a, Vol. I).* Even where mitigation projects have been completed, data on both short- and long-term success are insufficient to assess whether or not the projects were successful and, in many cases, basic monitoring data were not even available. Kusler and Kentula *(Id.)* summarized state of the art wetland restoration and creation as failing frequently, and varying widely in their ability to replicate values and functions. These investigators advise that, due to a lack of scientific knowledge, paucity of hands on experience with many wetland types, and lack of goal-oriented demonstration projects, wetland restoration and creation projects should be classified as experimental.

Other researchers note the need for additional information on wetland hydrology *(Hollands, G.G, 1989, Regional Analysis of the Creation and Restoration of Kettle and Pothole Wetlands, pp. 287-302 in J.A. Kusler and M.E. Kentula, eds. Wetland Creation and Restoration: The Status of the Science, USEPA, 600/3-89/038a, Vol. I;* and *Zedler*

J.B. and M.W. Weller, 1989, Overview and Future Directions, pp. 465-473 in J.A. Kusler and M.E. Kentula, eds. Wetland Creation and Restoration: The Status of the Science, USEPA, 600/3-89/038a, Vol. I); and that the scientific technology supporting wetland creation is completely lacking *(DePriest, D.M. and J. Christenson, 1988, Constraints on Mitigation Banking: Oregon's Mitigation Banking Act of 1987, National Wetland News, 10(6):9-11)*, and wetland mitigation is so new that many additional questions remain *(LaRoe, E.T., 1986, Wetland Mitigation: Progress and Problems, pp. 23-24 in J.A. Kusler, M.L. Quammen, and G. Brooks, eds.. National Wetland Symposium: Mitigation of Impacts and Losses, Association of State Wetland Managers, Berne, NY).* Zedler and Weller (1989) concluded mitigation does not replace lost wetland functional values, and research does not show restored and created wetlands can replicate regional biodiversity and fully functional ecosystems *(Zedler J.B. and M.W. Weller, 1989, Overview and Future Directions, pp. 465-473 in J.A. Kusler and M.E. Kentula, eds. Wetland Creation and Restoration: The Status of the Science, USEPA, 600/3-89/038a, Vol. I).* Research documenting the restoration of forested wetlands along streams or bottomland hardwoods is so recent that no examples document fully functional self-generating systems *(Kruczynski, W.L., 1989, Options to be Considered in Preparation and Evaluation of Mitigation Plans, pp. 143-158 in J.A. Kusler and M.E. Kentula, eds. Wetland Creation and Restoration: The Status of the Science, USEPA, 600/3-89/038a, Vol. I).*

Of equal concern as to the scientific uncertainty of wetlands mitigation is how such a proposal would operate within the context of the current Swampbuster program. For example, the administrative burden such a system would place on federal and state agencies responsible for monitoring mitigation projects would be tremendous. Insufficient monitoring and enforcement provisions exist for the current system, let alone the additional burdens associated with any proposed mitigation system. By both necessity and design, any widespread mitigation proposal would need private lands as a necessary component of the system. According to Golet (1986) such a system involving privately owned mitigation wetlands would be less likely to reach its goals

(Golet, F.C., 1986, Critical Issues in Wetland mitigation, A Scientific Perspective, National Wetland News, 8(5):3-6).

CLEAN WATER ACT SECTION 404 REGULATION OF AGRICULTURAL ACTIVITIES IS BOTH LIMITED AND REASONABLE AND DOES NOT WARRANT WEAKENING SWAMPBUSTER

Many of the changes being proposed to modify, weaken, or eliminate Swampbuster arise from fears and misconceptions concerning the application of §404 of the Clean Water Act (CWA) to agricultural activities. Because Swampbuster and §404 are very different programs, these fears are largely unfounded and their differences must be kept in clear focus.

Swampbuster and §404 do, however, have two things in common. First, both programs respect the right of the farmer to continue to farm the same land in the same way that it has been farmed in the past. These programs play a very limited role in farming practices, and affect producers only where they are changing their production practices in a manner that further restricts or reduces the flow or the extent of wetlands or other waters.

Second, both Swampbuster and §404 are essential in protecting wetlands and other waters of the United States from conversion and degradation due to agricultural activity. While landowner incentives to protect wetlands are also important, it would be the height of public irresponsibility to *pay* farmers to protect wetlands while also *paying* farmers to destroy them.

Swampbuster Does Not and Should Not Prohibit Wetlands Drainage Its Task is to Avoid Paying Federal Support to Agricultural Producers Who Convert Wetlands After 1985

Swampbuster does not *regulate* a farmer's operation but instead simply withholds commodity program payments from individuals who convert wetlands to agricultural production commenced after the law was enacted in December 1985. Generally, where a wetland was drained, dredged, filled or otherwise manipulated in a manner that makes possible agricultural commodity production prior to December 23, 1985, that wetland is deemed a "prior converted wetland" and is exempt from Swampbuster. The Swampbuster regulations clearly state that such wetlands conversions can be maintained without violation:

> "[m]aintenance or improvement of these converted wetlands for the production of agricultural commodities are not subject to this rule *so long as such actions do not bring additional wetland into the production of an agricultural commodity. (7 CFR 12.33)*

There are instances in which wetlands manipulated prior to December 23, 1985, continue to exhibit wetland characteristics and functions. While we would prefer to have these areas protected by withholding commodity payments to farmers who improve their drainage or other conversion of these already manipulated wetlands, a compromise in the administration of Swampbuster was reached which "writes off" many of these wetlands *(As a result, a wetland designated as "prior converted" under Swampbuster may still be a wetland covered by the §404 programs).*

However, where such previously manipulated wetlands are potholes, playas or other seasonally flooded or ponded wetlands -- wetlands recognized as retaining important wetlands functions despite prior manipulation -- they are not considered to be "prior converted wetlands" and thus are not exempt from Swampbuster. While this category of "farmed wetlands" is still covered by Swampbuster, farmers can continue to farm such wetlands under natural conditions or as they did prior to December 23, 1985. The only restriction is that:

> "no action can be taken to increase effects on the water regime beyond that which existed on such lands on or before December 23, 1985 unless SCS determines the effect on remaining wetland values would be minimal under §12.5(d)(1)(v)."

In sum, Swampbuster simply does not affect agricultural practices which have been employed in wetlands on an ongoing basis prior to December 23, 1985. It is only in those cases in which farmers intend to *further* drain or otherwise convert wetlands that Swampbuster applies. In addition, Swampbuster does nothing to preclude the farming of wetlands under natural conditions -- i.e., without conversion activity, despite the significant short term losses in wetland functions caused by such practices.

Any decision to exempt the remaining cropped wetlands from Swampbuster would be a decision to subsidize additional wetlands losses due to agriculture. Such a weakening of Swampbuster would insulate farmers from virtually any responsibility for wetlands protection, and would actually encourage farmers to destroy wetlands. The result would be to place the entire burden of protecting wetlands on agricultural lands on the American taxpayer, and to compound that burden by making taxpayers underwrite the costs of additional wetland drainage through federal crop subsidies.

Section 404 Does Not Regulate Normal Ongoing Farming Practices. Section 404 Only Requires a Corps of Engineers' Permit Where Agricultural Discharges Alter Wetlands or Other Waters.

1. Farmed wetlands are wetlands that must be subject to Section 404 in order to maintain the physical, chemical and biological integrity of the Nation's waters.

The primary reason farmers have become concerned about the administration of §404, and the primary reason those concerns are resulting in calls for weakening Swampbuster, is that, particularly in the Lower Mississippi River Valley, agricultural areas are now being identified as wetlands where they were not considered wetlands subject to §404 prior to January 1989. The reason for this change is that in January 1989, Corps, EPA, FWS, and SCS scientists and regulators agreed on a joint methodology for identifying wetland boundaries based on the long-standing wetlands definition in the Corps regulations and the very similar statutory wetlands definition in the 1985 Food Security Act. Before the joint methodology was in place, certain Corps districts, particularly those in the Lower Mississippi River Valley, were drawing wetlands boundaries narrowly, often excluding areas which had been farmed but still were wetlands and functioned as wetlands.

The joint methodology was developed by the Corps, EPA, SCS, and FWS in response to years of criticism from environmentalists, Congress, and the regulated community that there needed to be one method for identifying wetlands in order to avoid confusion and inconsistency. The federal agency experts finally developed, field-tested, and began to apply such a uniform and biologically defensible methodology in 1989. While that methodology may not identify wetlands in a way the agricultural *community* doe, it *does* identify wetlands in a manner which comports with the goals and directives of the Clean Water Act and Swampbuster and it *is* scientifically-grounded.

To protect our Nation's wetlands requires identifying and including in Swampbuster and §404 all wetlands meeting the federal definition. Excluding farmed wetlands from these programs for political convenience -- by redefining wetlands or by exempting them from the law -- not only undercuts years of work by the agencies to arrive at a joint methodology and provide consistency, but also eliminates any opportunity to protect these wetlands. The joint federal delineation methodology is scientifically sound and administratively workable. It should continue to be the basis on which federal wetlands conservation programs are implemented.

2. Normal ongoing agricultural practices are not regulated unless they change the use of a wetland area and impair the flow or reduce the reach of wetlands or other waters.

Just because a farmer's wetland is identified and mapped as subject to Swampbuster and §404 does not mean that activities to be conducted within such wetlands are prohibited or even restricted. First, §404 only regulates discharges of dredged or fill material into wetlands and other waters of the United States. If there is no discharge §404 does not apply.

Second, many farming practices are generally exempt from §404. Normal, ongoing farming, silviculture, and ranching activities are generally exempt. In addition, maintenance of currently serviceable levees and drainage ditches, as well as construction and maintenance of farm or stock ponds, irrigation ditches, and farm roads are generally exempt from §404. Discharges related to these agricultural activities are only regulated if they are part of an effort to change the use of the wetlands area in a manner that impairs the flow, circulation, or reach of wetlands or other waters.

In the case of rice farming in the Lower Mississippi River Valley, for example, ongoing rice production operations, such as the maintenance of existing, currently serviceable rice levees, are exempt from §404 and do not require any action to comply with that provision. Rice production as part of an accepted rotation is still considered to be ongoing and exempt from §404. It is only when landowners are installing new rice levees to control wetland water levels for rice production, either for the first time or after an extended abandonment of such production, that the discharge to create the levee results in a change in use requiring a §404 permit from the Corps.

3. Where §404 does apply to agricultural activities, it does not necessarily prohibit them as long as they are conducted in accordance with a §404 permit.

Even where a §404 permit is required, permit conditions can usually be tailored in a manner that both protects wetlands and recognizes the constraints of farming operations. Rice farming in the Lower Mississippi River Valley presents a good example of §404 regulatory flexibility. While EPA and the Corps now concur that new rice levees require a §404 permit, these agencies are working with FWS to develop a regional general permit authorizing such levee construction without the need to even apply for an individual Corps permit. We understand that the agencies do not expect rice production in this area, as currently practiced, to have significant adverse wetlands impacts. As a result, we understand they are developing a regional general permit that will require little from rice producers as long as normal rice production practices for the region are employed.

Where discharges associated with agricultural activities which change the use of a wetland area have more significant and long-term wetland impacts, an individual §404 permit should be required. In such cases, the §404(b)(1) Guidelines require the landowner to first attempt to avoid and minimize adverse impacts to wetlands and streams through the use of practicable alternatives. To be "practicable," such alternatives must be available, feasible, and must achieve the basic purpose of the landowner's intended project. If there is no practicable way to avoid or reduce the impacts to wetlands and waters, then the §404 (6)(1) Guidelines require the landowner to compensate for such unavoidable losses. Such compensation might involve restoring former wetlands on the farmer's land which were drained in the past, or contributing to a larger wetlands restoration effort nearby.

The goal of the Clean Water Act and §404 is to maintain and restore the physical, chemical and biological integrity of the Nation's waters, including its wetlands. While §404 can be implemented in a fair and flexible manner, the agricultural conversion of wetlands to other uses must be controlled by requiring landowners to avoid wetland conversion where feasible and, at a minimum, to fully compensate for lost wetland functions.

Both Swampbuster and §404 Are Essential to Protecting the Nation's Wetlands from Agricultural Conversion and Can Be Administered with Fairness and Flexibility.

Swampbuster and §404 can be implemented in a manner that both protects our Nation's water resources and is flexible, reasonable, and fair in its treatment of agricultural producers. The key to the success of these programs lies in large part with Congress. Many of the past problems with both §404 and Swampbuster are attributable to the lack of a clear wetlands protection mission and the lack of field staff and staff resources. Congress must provide a strong and unwavering wetlands protection mandate *and* adequate field resources to the ASCS, SCS, FmHA, FWS, the Corps, and EPA to carry out that mandate efficiently and effectively. The agricultural sector must receive an unequivocal signal that wetlands conservation, like soil conservation, is standard practice on agricultural lands. In addition, wetlands must be accurately mapped and their values and functions scientifically determined in order to foster informed decisions about where and when wetlands should be protected, used, converted, and restored.

Now that, for the first time in the history of these programs, the Corps, EPA, SCS, and FWS are beginning to develop consistent positions and procedures, to get the field resources and direction they need to be responsive to the regulated community, and to obtain the wetlands mapping and functional assessment information they need to make good wetlands conservation decisions, these programs can and should be administered in a fair and flexible manner on agricultural lands.

Swampbuster and §404 should be given a chance to work. The solution to protecting wetlands on agricultural lands is not, as some have suggested, to redefine or otherwise exempt wetlands located on agricultural lands from Swampbuster and §404. The solution is to recognize these wetlands and waters for the nationally-important resources that they are, and to develop and implement reasonable programs to ensure their public functions and values are conserved.

FRAGILE SOILS MUST BE BETTER PROTECTED

Great strides in land management have been made since the devastation of the 1930's "dust bowl," however the problem of soil erosion still persists and must be addressed in the 1990 Farm Bill. The strides made in the 1985 Food Security Act to reduce soil erosion demonstrate that national farm policy can be an effective tool for addressing this major environmental issue. Nearly 34 million acres of the Nation's most erodible cropland has now been enrolled in the Conservation Reserve Program and is, at least temporarily, protected. In addition, farmers have now prepared over 1 million conservation plans for highly erodible cropland pursuant to the 1985 FSA's Conservation Compliance and "Sodbuster" provisions. And, while these programs have provided environmentally significant benefits by decreasing soil erosion and increasing wildlife habitat, they have yet to realize their full potential.

Under Sodbuster, farmers who plow out highly erosive lands are to be denied federal benefits unless a conservation plan is developed with the Soil Conservation Service (SCS). *16 U.S.C. 3811, 3812.* Despite hopes early on that Sodbuster would protect fragile lands from being broken out, thousands of acres have in fact been converted to cropland under SCS approved plans since 1985. To our knowledge, SCS has not denied a single application to open new lands to crop production, regardless of soil types or their potential for erosion.

A study recently conducted by the U.S. Fish and Wildlife Service in Montana gives an indication as to the scope of this problem. Reviewing SCS approved conservation plans in five of Montana's 56 counties, the USFWS found that almost 57,000 acres of highly erodible lands had been broken out between 1987 and the summer of 1989. If this information is indicative of sodbusting activity throughout the northern great plains, then hundreds of thousands of acres of native prairie have been plowed under despite the conservation provisions of the 1985 Farm Bill.

Unless sodbuster is changed to remedy this problem, farmers will continue to break out thousands of new acres and the Nation will continue to suffer from soil erosion and the loss of valuable wildlife habitat. The NWF therefore, recommends making the following changes in the 1990 Farm Bill to tighten Sodbuster and to provide real protection for fragile soil and native prairielands:

1. Federal benefits should be denied producers who elect to break out fragile soils of type VII or higher. Sufficient cropland now exists in the United States to make farming such lands unnecessary. The negative impacts of cropping these lands, even under SCS-approved conservation plans, far outweigh any benefits that may be derived.

2. The SCS should establish a No Net Loss soil erosion policy. Under this policy, SCS would require producers to conform to the "T" soil loss tolerance level on any new sodbreaking request.

3. Require annual certification that producers are complying with conservation plans developed under sodbuster.

Another major element of the 1985 FSA is the Conservation Reserve Program (CRP). Under this program, millions of acres of marginal farmland have been set aside for conservation purposes with substantial benefits accruing to soil stability, water quality and fish and wildlife habitat. Despite these gains, there are at least three significant shortcomings with the CRP that need to be addressed.

First, there appear to be significant problems coordinating implementation of Sodbuster and CRP. Fully one third of the 361 producers in Montana who broke out new acreage under SCS-approved conservation plans also had taken other fragile lands out of production and enrolled them in the CRP. Such lack of coordination is expensive, fiscally and environmentally. Wholesale destruction of ecologically diverse rangelands, which take years to establish, in exchange for CRP lands which initially provide only minimal wildlife value, is a bad bargain for taxpayers and the land.

Second, problems exist with management of the CRP. Under the program, 34 million acres of fragile lands have been taken out of production and converted to range or forest under contract with the Commodity Credit Corporation. *16 U.S.C. 3831.* Acreage enrolled in CRP is planted according to a conservation plan developed between the producer and SCS. *7 C.F.R. 704.9.* While much of the acreage in CRP is providing important wildlife habitat for many species, other CRP lands have been planted to near monocultures of introduced grasses that provide little wildlife habitat. In this context, SCS has ignored Congress' clear guidance to protect and improve wildlife habitat on thousands of CRP acres. One of the articulated purposes in establishing the CRP was to "create better habitat for fish and wildlife through improved food and cover and better moisture conditions." *H. Rep. 99-271, 97th Cong., 1st Sess. 81 (1985).* Other purposes included the protection of long-term production capabilities, the reduction of soil erosion, the reduction of sedimentation in streams, the improvement of water quality, the reduction of production and additional income support. *Id.*

Finally, provisions must be developed in the 1990 Farm Bill that deal with the expiration of CRP contracts as they occur over the course of this decade. We must not repeat the great mistake of the soil bank program of the 1950's, where millions of acres of land went back into commodity production once federal payments were terminated. Farmers should be encouraged to establish conservation easements on CRP lands, in order to protect them from conversion to cropland and to preserve them as open space.

In sum, we would suggest the following changes in the Conservation Reserve Program:

1. Lands in the Conservation Reserve Program must be planted so as to maximize wildlife benefits. SCS should be required to develop plans that accomplish this goal on all newly protected acreage.

2. Mechanisms should be developed to preserve CRP benefits after contracts expire.

AN ENVIRONMENTAL STEWARDSHIP PROGRAM MUST BE ESTABLISHED TO PERMANENTLY PROTECT VULNERABLE LANDS

Both the American public and the private land owner benefit from stewardship practices that conserve soil, water, wetlands, and wildlife. Unfortunately, federal farm programs historically have not encouraged, but have in fact sometimes prohibited, such sound conservation practices. It is time to resolve these problems and to ensure that federal support for resource conservation and environmental stewardship be given equal consideration to supporting commodity prices and farmers' incomes.

The present CRP and other agricultural conservation incentive programs must evolve to meet current budgetary and environmental realities to give a "bigger bang for the buck." While present Farm Bill programs protect public resource values, they do so only temporarily through short-term contracts, typically expiring in 10 years. In many cases, the landowner receives rental payments that equal or exceed the fee title value of the property. None the less, the public has no assurance that the conservation values in which their taxpayer dollars were invested, to the tune of millions of dollars, will be maintained beyond the contract period.

To most effectively, efficiently and equitably allocate limited federal dollars, a single federal program -- the Environmental Stewardship Program (ESP) -- should be established to provide financial assistance to farmers who accept perpetual easements on their environmentally sensitive lands. The program should be funded through easement contracts obtained by the Commodity Credit Corporation. The ESP should provide permanent protection to such lands as (1) wetlands at risk from agricultural activities (including farmed wetlands and unfarmed wetlands at risk of conversion) or those prior converted wetlands whose restoration could provide important environmental benefits, and (2) areas contributing to surface water quality problems.

Establishment of an easement manager to monitor the ESP will be crucial to the success of the program. Depending on the land and the values being protected, the USFWS, the USFS, the USBLM, or state fish and game agencies may be most appropriate, although priority should be given to designating the USFWS as easement manager. In any case, the Secretary of Agriculture should be required to establish a central management agency for permanent easements as they are established.

In certain situations, limited economic use of lands enrolled in the ESP may be compatible with the purposes for which an easement is established. Haying, grazing during certain periods, and hunting and other recreational uses often are suggested as being potentially consistent with the conservation values this program seeks to protect. For instance, continued farming of some temporary wetlands could be consistent with the easement purpose if the hydrology of the basin is not changed, and the intensity, method and timing of use is specified in order to protect the ecological characteristics of these wetlands. Clearly, prospective economic uses must be fully evaluated for their biological impacts and approved through a formal agreement with the easement manager.

We suggest that the SCS, with concurrence of the USFWS, be allowed to develop economic use agreements with landowners upon a formal finding that the proposed use is consistent with the purposes of the easement. These agreements should be developed in close consultation with the easement manager, the state fish and wildlife agency, the Administrator of the Environmental Protection Agency and other federal agencies, and should specify the terms of the use as well as the method and responsibilities for monitoring compliance. All economic use agreements should include an emergency "kick-out" clause or provision whereby the economic use of the ESP land is terminated immediately if the agreement is violated. Economic use agreements should be reviewed at least once every five years, and revised as necessary to better accomplish the purposes for which the easement was established or to better facilitate the consistent economic use to which the land is put. All changes to the agreement must be accompanied by a formal finding that the use as specified in the agreement is consistent with the easement purposes.

CONCLUSIONS

The decisions made on the Conservation Title of the FSA during the next several months will play a crucial role in determining the legacy we leave to future generations of Americans. The NWF believes it imperative that the Nation's natural renewable resources be protected, and restored where possible. We strongly encourage Congress to resolve the shortcomings of Title XII of the 1985 FSA identified in this testimony. If this is done then -- for once -- America's agricultural policies will finally be brought into line with America's national environmental policies.

Senator **Fowler**. I want to thank my friend, Mr. Grassley, who is not a member of the committee, for sticking with me all day and showing his characteristic interest in these matters of public policy and give you the first opportunity for any questions for as long as you like, Brother Chuck.

Senator **Grassley**. Thank you, sir. I think you suggested that the county system for enforcing swampbuster has not worked. On the other hand, if there is an exemption for the enforcement of the swampbuster provisions, this would be the first farm program that the county system has not administered for 60 years. After all the county system is the basis for the administering of all the farm programs, and I just raise that point. I think that if we are going to detract from, you know, 60 years of farmer decisionmaking at the county level, where there is a great deal of confidence built in the system, and I think there is extreme need to wait for that change to be made. In addition, I would suggest that if they cannot enforce swampbuster, then I think maybe you have raised the question: "Can they enforce other aspects of the farm legislation as well?"

In regard to the 300,000 acres you expressed that had been lost, wetlands which have been lost since 1985. Is some of that under commenced determination, or is all of that outside of commenced determination? In other words, I am suggesting to you, yes, maybe there is some wetlands that were wetlands in 1985, but there is probably some of that that was determined by Congress would be lost because of commenced determination.

Mr. **Berle**. I cannot give you the breakdown on that.

Senator **Grassley**. OK.

Mr. **Berle**. But I think that the overall problem, if you look at wetlands losses throughout the United States, we are still losing at a substantial rate.

Senator **Grassley**. Oh, I do not doubt that. I do not doubt that. I should also express a view that I think that the basic law that we passed in 1985 is a pretty good law. And I believe that the regulations we passed that go with it are pretty good law. But where we have problems are these manuals that come out to enforce them, I believe. I think that is what we have to take a look at, the manuals that are being used to carry out the law. Is the Fish and Wildlife Service, to what extent with your written agreements with the USDA are you lead agency?

Mr. **Turner**. Senator, I have only been here about 8 months, and I was thinking here when the chairman asked how relations were, and I have active negotiations and MOU's and cooperative agreements going now with six entities over at Agriculture. I have spent a lot of time over there. We have authority, and even that is not direct, in the 404 process where we consult with EPA and the Corps of Engineers. The only authority we have under swampbuster, as I understand it, is the minimal effects determination on mitigation. We have to concur with that, and there are a few hundred of those a year. I am at least told that we have had 100 percent agreement with SCS people in the field. We would certainly have some authority on endangered species questions. You would be aware of those. Those are the types of enforcement we have right now.

Senator GRASSLEY. So in some respects where the law says consult, you actually do have a veto under your written memorandums of understanding?

Mr. TURNER. We do not have any vetoes.

Senator GRASSLEY. Well, you said you had concurrence. Does that not effectively mean——

Mr. TURNER. The only place, Senator, that we have some authority in programs discussed here that I am aware of is swampbuster, and it is where if on a farm we find a wetland, an area that is a little wet, and SCS makes the call. If it is a tractor rut, they can say, look, go ahead, that is not a problem. If it has some values, it is their choice to come to the Fish and Wildlife Service and say would you agree with us that this needs mitigation. That is the only authority we have in the swampbuster, as I understand it, Senator.

Senator GRASSLEY. I want to go through five cases that come out of a county, in Butler County. These are some examples. The county committee had approved five requests. All requests were sent to the Fish and Wildlife Service in the fall of 1989 as per their request. The Fish and Wildlife Service denied the following request. It was determined at that time—there were four requests then denied—it was determined at that time that one of the persons with a previous conversion did not need to be a commenced determination. We then notified the four producers that Fish and Wildlife had denied their requests. The four were appealed to the county committee, and provided additional information. After working in more depth, one of them working with another county, it was determined that that farm was not going to be farming any drained wetlands. Additional information for the remaining three producers was sent to the Fish and Wildlife Service. All three had continued their drainage since county committees approved them and farmed this area.

On December 20, 1989, the Fish and Wildlife Service notified our office that one of the requests had been approved but two had not been. The examples cited—and this is a quote from the letter—"Examples cited in the instruction for wetland conversion provisions for commenced determination state that items beyond the producer's control include court orders to stop activity and physical disability." And then it goes on to say "shortage of funds is specifically cited as a reason which is not considered beyond the producer's control." Well, the realities of farming are that if you do not have money you do not do anything, and particularly when you are making capital improvements, you do not probably borrow money.

So we have farmers that do not have the money to do something that was commenced. The county said they could do it, and, you know, wait until they get the money to do it because obviously in 1983, 1984, 1985, 1986 in the Midwest it was just a terribly bad time. And so it seems to me that your people out there studying these things ought to take into consideration that economics has quite a bit to do with farming, particularly if you are going to make these expensive improvements. And see now these farmers are in limbo because of what the Fish and Wildlife Service says. So I guess I am saying the law says consult, but you have all the county committees out there intimidated to a point where now these farmers do not know whether they are going to get qualified for the program next year.

And I do not know. All I can say is, it is a very good law, very good regulations, but, if we were debating this in 1985 and somebody was saying out there, well, you do not qualify for commenced determination unless you spend the money right now, you do not have the money, well, that stuff would have never got through Congress. So I think that you have effective veto whether you really think you do or not, and you have people out there exercising it.

Mr. TURNER. Senator, I would be happy to look into those cases personally. I know we have had relationship problems and things are tense in your State. In fact, I have some people out there right now that I sent back out there. Wilson Scaling and myself sent a team out there to work on a question on your no net loss and how we are going to apply it, and I made that effort simply as a result of discussing it with officials from your State. He said if you come back out here, I think there is a lot of misunderstanding. The law does not give us veto authority. If we have in any way, if your local county committees and agriculture people are scared of the Fish and Wildlife Service personnel, it is one of the few places in this country that that is occurring, that we have terrorized anyone. But I would be happy to look into those and see how our people have behaved and respond to you accordingly.

Senator GRASSLEY. Yes. And then also for, whether this is consultation or not, I guess I want to bring up a point that in Minneapolis in February 22–23, 1989, your agency called a meeting of ASCS, SCS, State Department of Natural Resources, Farmers Home Administration. According to this letter——

Mr. TURNER. When was this, Senator? Excuse me.

Senator GRASSLEY. Well, this was in February of 1989. And I will quote just some of it. "During the past 24 months our agencies and the public have worked together to take advantage of the wildlife conservation opportunities presented by the farm bill." And there is nothing wrong with using the legislation the way it should be used. I am just saying here that your agency calls agriculture agencies together to see how we are going to use the 1985 farm bill to get more land under water. And I think that that determines a very aggressive role for your department as opposed to being a consulting agency. I think it implies that it is trying to be a lead agency. I guess this is what scares me when I read this in the paper.

It says the goal is to flood corn fields. The headline says Ron Howard pointed across a rolling corn and soybean fields. This is near Estherville, Iowa, but in his mind he saw, and this is a quote, "I have dreamed for years of plugging tiles and putting water back on the land where there used to be a marsh." Now, if the Government wants to condemn it and pay for it, that is one thing, or if you want to use other public subsidies to do it, it is OK. But what we passed in the antiswampbuster's bill was that we are not going to subsidize the abuse of soil anymore or subsidize the draining of land. Land that has been farmed for 70 or 80 years in northern Iowa where they have drainage districts, and people have been paying into these drainage districts for years. Are we going to put that back under water?

Mr. TURNER. No.

Senator GRASSLEY. I wonder. Is that what you want to do?

Ms. WILLIAMS. No. In fact, swampbuster very specifically is designed to prohibit the conversion of new wetlands to agricultural land. And we are looking for true and full implementation of that provision, not so that we go back and flood a corn field that has been there for 50 years, but so that we do not turn another wetland into a new corn field.

Senator GRASSLEY. Well, then, you see you and I can talk the same language. But——

Senator FOWLER. Well, we are making progress. [Laughter.]

Senator GRASSLEY. There have to be some people out there that do not see it the way you see it or the way we saw it when we wrote the language, you know. And when you have farmed wetlands and they are tiled, and you have to get permission to go out with a spade and dig up a foot of tile and put it in, I am not going to do that. I should not have to do that. You should not expect me to do it.

Ms. WILLIAMS. I do not.

Senator GRASSLEY. If I have a tile that is broken, I ought to be able to go out there and patch it.

Ms. WILLIAMS. Yes, and in fact, if you look at the regulations for implementing swampbuster, there is absolutely no problem with maintaining existing tiles. You only run into problems if you are trying to extend the scope of that tile so that additional wetlands are drained.

Senator GRASSLEY. OK. But, you see when I get a notice from my local ASCS office and it comes to me, not in my role as a Senator but in my role as a farmer, and it says if you have a broken tile, report it to us, you know that implies nothing but the creation of a police state environment. I ought to be able to fix a broken tile without being able to go to my county ASCS office and say, I have a broken tile; can I go out there with a spade and fix it?

Ms. WILLIAMS. I know one of the things that I have seen that is very encouraging in all of this debate is that everyone seems to be getting in the battle arguing over who is the best environmentalist. That has to be an indication that we all agree on the fact that protection of these environmental values is a worthwhile goal. And it probably is useful, as the chairman said earlier, if we all try to ignore the rhetoric that gets thrown around in the press, and get off of the anecdotal stories and instead try to deal with very specific situations and very specific national trends in implementation. The rhetoric level is getting high enough that it is inhibiting our ability to adequately and fairly negotiate the issue.

Senator GRASSLEY. Mr. Chairman, I think that concludes my questions.

Senator FOWLER. Thank you. I find these specific problems both in Iowa, and we have some in Georgia. There are many specifics that have to be where we have to find a better way to skin the cat. I do think Ms. Williams is right. We are all trying to do the same thing. At least from my point of view and the point of view of the committee, I can be very clear, though there is some controversy.

The President wants to, has announced a policy of no net loss in wetlands. I think as a matter of national priorities, we ought to do better than that. We ought to try to succeed in a policy of net gain.

Agricultural conversion has been the primary source of loss of wetlands over a 200 year period of our country. And if we are to sustain our agricultural production and also protect our water, our wildlife, all of the goals that we share, we need a policy that continues to gain in our wetlands. I am very pleased with what the Director said about your efforts so far as well as the relative, as the small costs that you have been able to, in the implementation of your restoration. When you said that were you were trying to do 45,000 more acres a year, is that possible with existing budgets and personnel?

Mr. TURNER. Mr. Chairman, I am proud of our restoration gains and let me thank you personally as chairman because it has been your interest and assistance to us that probably 20 to 30 percent of the restoration acres that we have accomplished has been directly through help that you have initiated. The President's budget has a farm bill initiative in the budget that is before you that, in fact, would allow us to restore 45,000 acres on our farm bill on private lands.

Senator FOWLER. Do you know how much that is? What his budget, what kind of an increase he calls for, just off the top of your head?

Mr. TURNER. I will get that to you.

[The material was subsequently provided for the record and follows:]

For fiscal year 1990 the Service will expend a total of $7,995,000 in support of our overall farm bill effort. The 1990 funding is composed of $5,995,000 appropriated specifically for farm bill wetlands restoration and $2 million for other wetlands restoration efforts appropriated through the migratory bird program. These funds are being utilized in actual construction and direct staff support for wetlands restoration activities "on the ground." The Service anticipates restoration of 45,000 acres in 1990.

For fiscal year 1991, the budget requests $8,002,000 for farm bill wetlands restoration activities. This represents an increase of $2 million specifically for farm bill efforts in 1991. Funding for 1991 will permit the restoration of approximately 45,000 acres of wetlands. The 1991 budget also continues the $2 million appropriated through the migratory bird program in 1990. These funds will support wetland restoration projects in support of the North American Waterfowl Management Plan activity. It is anticipated that 10,000 acres of additional wetlands will be restored in 1991.

To achieve the greatest possible wetland restoration results under the farm bill wetland restoration program, the Service utilizes the following general criteria:

(1) Not less than 70 percent of the funds are expended to restore and facilitate the control of shallow water on agricultural wetlands (e.g., installation of drop-log or gated pipe structures, levees and small dams, tile breaks and ditch plugs, etc.) and to restore bottomland hardwoods through planting in conjunction with implementation of water control measures.

(2) Up to 30 percent of the funds may be used to provide technical assistance to agencies of the Department of Agriculture and to individual farmers in direct support of the wetland restoration and protection efforts.

(3) The land or interest in land must be secured at no cost to the Service and for a duration that justifies expenditure of the restoration funds. (The Service implements its restoration projects on Farmers Home Administration easement areas and on Conservation Reserve Program lands. Projects on private farm lands are also implemented where the landowner will voluntarily agree to allow such restoration project to be implemented.)

(4) The expenditure of funds is to be focused first on lands under permanent and long-term easement, and secondarily on Conservation Reserve Program and other private lands where the duration of the agreements is less.

(5) The focus is to be on wetland restoration and protection to provide habitat for the broadest array of wildlife at the lowest cost to the Service, with activities directed toward the Lower Mississippi River Valley and Prairie Pothole Regions, but also proceeding in all States having significant wetland restoration opportunities.

Senator FOWLER. Mr. Herreid, let me go back. Mr. Nebel raised this; I think, too, it was implied in his testimony to us. Do you think farmers will support stronger conservation measures being tied to farm program benefits? For instance, Mr. Nebel was saying, at least what I heard him say was—is he still here? Yes, there you are. What I heard him saying was we cannot expect us to do more conservation and continue to recommend lowering of target prices. We have to get the target prices up and then maybe we can get the conservation. Do you see this, these conservation efforts, as being tied to the farm program benefits, or do you believe farmers such as in North Dakota would respond better to payment incentive programs such as the Conservation Reserve Program? Or is my formulation off base?

Mr. HERREID. I think when we look at the wetland problem, it is definitely at a crisis level right now in America, and I do not think anyone will deny that. I think everybody is pretty much in agreement on that. And I think to resolve it——

Senator FOWLER. What is a crisis?

Mr. HERREID. The level of wetlands that we have lost in the country. I think in order to solve the problem and start moving in a positive direction, it will take a combination of both. I do not think it is all one way or all another. I think it is going to take a combination of both types of proposals.

Senator FOWLER. Mr. Nebel, clear up my paraphrase of your remarks.

Mr. NEBEL. I would rather see the loan rates increase before the target prices because the loan rates set the floor at the marketplace. And by increasing the loan rate, you are going to raise the market price up.

Senator FOWLER. You were saying that with loan rates and target price. You want to get those up as a way to pay for the conservation requirements that we are proposing?

Mr. NEBEL. I would like to see the loan rates raised before I would like to see the target prices raised.

Senator FOWLER. I understand.

Mr. NEBEL. If we get the loan rates up there, and I can sell my commodity at the marketplace, I do not need that target price. That target price is a ceiling. And if I can sell it at a profitable level with a high loan rate setting the market price, I do not need deficiency payments anymore.

Senator FOWLER. The conservation organizations here, does restoration work?

Ms. WILLIAMS. If I may, before we move on to that issue, respond just briefly to the last one. I think you will find by and large that the American public would be very willing to do whatever is necessary to assure that the farmer can make a living on their land and protect the environmental values that are so important. I do not think any of us here argue that we need to bankrupt the American farmer to save our natural resources. What we are saying, particularly on wetlands, is that if you want to ensure long-term economic sustainability of agriculture, you also have to retain the wetlands. We are willing to contribute to that, and frankly I think we are now.

Senator **Fowler**. Well, I understand that. But I am more interested in what the farmer thinks because he is the one, if it is his idea, if he believes it to be in his self-interest, then we will not only save what we got now, but we will protect a lot more.

Ms. **Williams**. You are going to have to approach it from both directions. Not only must we provide incentives, but we have to have a strong swampbuster, too. We think that maintaining farmland is important and is one of the big things we are working on. In fact, the National Wildlife Federation is very actively trying to maintain ag land and not see it become a city or a factory or something like that. Preservation of ag land is important. Obviously, in order to preserve ag lands it must be economically feasible for the farmer to stay out there. So if raising the loan rate is what he thinks he needs in order to make it go, he is obviously the best judge of that.

Senator **Fowler**. Thank you. Mr. Berle, does restoration work?

Mr. **Berle**. The answer is it does and it does not. And let me explain that. We are engaged in wetland restoration. We are buying land in the Central Valley in California and putting it under water. Shortly after that happens, those lands are filled with waterfowl because there is so little habitat left that anything that you create has a tremendous impact. The real question is whether, as you look at swapping things around, and this gets to the mitigation issue, can I take an acre here and stick in a couple here, and come out even, there the answer is not at all clear, and in many cases the answer is no. We do not know enough about how these systems work. It is very convenient for the developer to say I will give you some more somewhere else, but when you screw it up here, the impact on the area may be much greater because of the quality and so on.

So that I would urge the committee to think about not to get caught in the trap of acre for acre, if it is 2 acres, then it is better than 1 acre, and therefore it is good. We should be looking at net increases. There is no question about that. Also, we have to be thinking about quality. So, sure, we ought to be urging and pushing for as much restoration as we can get, but we should not assume that we know enough to figure out how to make a trade off—you can take some away some places and add some others. In some places you never can because you are dealing with different hydrologic systems. A loss here may cause a whole system to fall apart where adding a couple of acres somewhere else where there may be already systems that work may not be that beneficial.

Senator **Fowler**. You have heard, I am sure, and some of it came from Mr. Turner, their efforts, advocates of harvesting timber or harvesting cranberries, grazing on wetlands. What does the Audubon Society think about that?

Mr. **Berle**. In places where you have basically wet meadows that ought to be protected as such, there are times of the year when you can take hay and other things, and you can get the best of both.

Once you start talking about timber, once you start talking about cranberries, which frequently means substantial chemical application, I think it is much more difficult. So I think our view is that there are some places in limited areas in which you can do both. But as a matter of national policy, we have got to be pretty cautious about that.

Senator FOWLER. Mr. Berry, what have you heard today that you like and what have you heard today that disturbs you?

Mr. BERRY. Well, I think American farmers and landowners would be perfectly happy to restore these wetlands and leave them alone as long as they got paid for the privilege. I personally——

Senator FOWLER. As long as they get paid for the privilege?

Mr. BERRY. Yes, sir. I personally own in excess of 1,000 acres of wetlands and the only privilege I get off of it is paying the taxes, and when somebody else is going to tell me what to do with it, I would like for them to pay me. They usually have to pay me for other privileges like that, and right now they are in standing in line telling me what I can and cannot do with it. But nobody wants to pay for the privilege.

Senator FOWLER. How do you feel about an easement? Would you be——

Mr. BERRY. I think it would be a wonderful idea.

Senator FOWLER. Would you like us to put that in easement, a conservation easement?

Mr. BERRY. Yes, sir.

Senator FOWLER. You could tell folks that they could hunt it and fish it. You would totally control the access to your land. Would you want anything more than that?

Mr. BERRY. No, sir.

Senator GRASSLEY. You want protection from suit?

Mr. BERRY. Right.

Senator GRASSLEY. For people that come on there.

Mr. BERRY. Right.

Senator FOWLER. But I mean you would not require it to be timbered, would you?

Mr. BERRY. No, sir. I think if you established a realistic program like that, something similar to CRP, or even a longer term easement agreement, that you would be amazed how much wetland would be put into it, especially in the Midsouth.

Senator FOWLER. So the key in your mind would be just that you had control of the access; would it not?

Mr. BERRY. Yes, sir, right.

Senator FOWLER. As well as a little sugar to mitigate those taxes?

Mr. BERRY. Right.

Senator FOWLER. Mr. Berle.

Mr. BERLE. Let me suggest that the easement program does some other things for the landowner. It creates another host of issues with respect to local government, but obviously if the landowner has sold some recognized development value, even though development value in wetlands is by definition limited, his value goes down, and presumably that gives him a break with the local assessor. Now it does not always make the local assessor happy because he may have to make it up somewhere else. But I have been involved in planning in a number of States in which programs are being developed in which in certain areas States are prepared to purchase easements and define the tax break that is involved. And in some areas to contribute to local, in effect, pay a local tax or an amount in lieu of tax for the easement. That gets to be complicated, but all I am suggesting is that there is a lot of thinking going on in some States on that level which offers some interesting possibilities.

Senator FOWLER. Does the Sierra Club or the Wildlife Federation or the Audubon Society, any of you have any recommendations that we ought to move our wildlife initiatives out of the Department of Agriculture and put it exclusively under the jurisdiction of Fish and Wildlife or EPA, anything else?

Ms. WILLIAMS. As was mentioned earlier, a lot of these issues interface with the farmers through the Department of Agriculture, and what we need to do is make that system work. I think that definitely requires a much greater role for the Fish and Wildlife Service. They are the ones with the wildlife expertise and knowledge.

If we had a perfect world where the farmers were not intimidated by or antagonistic to the Fish and Wildlife Service it would make a lot of sense to have Fish and Wildlife Service just flat out be in charge of implementing swampbuster. That certainly would eliminate one extra person that needs to be dealt with if you just go straight with the Fish and Wildlife Service. When you weigh it and try to decide what is going to make swampbuster work, it appears that both agencies must be heavily involved so that you provide the assurance of some familiar faces to the farmers, but you get the sound biological decisions on these issues that are based in biology because of the involvement of the Fish and Wildlife Service.

Mr. HERREID. I would like to echo what Cindy said and just state that with my work and observation of the way the county committee process has worked in North Dakota is that it has put the county committees in a real awkward situation. They are having to play almost a Jekyll and Hyde role. On one hand, they are administering the farm program, and they are charged with deriving a positive benefit to the producers. Then, on the other hand, the enforcement role of swampbuster primarily rests with your county committee members. In that role, they are required to wear a different hat, and they have to play policeman with their neighbors, the person living next door to them.

And quite frankly, I myself would not care to be in that role, you know, where you have to turn and do something tough to a friend of yours if they violate the law. And because of that, I definitely feel along with the Sierra Club, that the effectiveness of the swampbuster program would be strengthened by a large role played by the Fish and Wildlife Service.

Senator GRASSLEY. For years the county committees have been fining farmers, making decisions against farmers. They are in an adjudicatory process, or at least a quasi-adjudicatory process all the time with just so many farmers. You know the biggest ones I can remember are CRP's, fines for not mowing CRP, or not having it adequately seeded, just horrendous fines in some of the counties, done by some of the county committees in my State. They are the same people that make the determinations on wetland abuse.

Mr. **Herreid**. I think with swampbuster, though, we are dealing with an area where the technical expertise is definitely with the Fish and Wildlife Service on this, and I think that is the real turnstone on this.

Senator **Grassley**. Yes, but sure, you can consult and decide, take the Fish and Wildlife's information in consideration, and still make the same decision if you are going to be punitive to a farmer that you have to make on CRP for not keeping the weeds under control.

Mr. **Berle**. I think my view on that was that we need more consultation. We need to use that expertise. But I think John Turner has enough to do now without having to go and run all the county committees. But I think there is a need, and that, I think, really does get to this business of working this thing out and working through it to see that there is a higher level of consultation because I am not sure that that was fully understood by all the committees as they got going. This was a new program.

Senator **Fowler**. Well, ladies and gentlemen, we thank you for a very fine hearing and look forward to working with you and completing the job.

Ms. **Williams**. Thank you, Mr. Chairman.

Senator **Fowler**. In addition we have some written statements for the record including a statement by Ann Y. Robinson on behalf of the Izaak Walton League of America; Eric W. Schenck of Wildlife Management Institute; and the National AgriChemical Retailers Association. Without objection, these will be made a part of the record.

[The prepared statements of Ms. Robinson, Mr. Schenck, and the National AgriChemical Retailers Association follow:]

THE IZAAK WALTON LEAGUE OF AMERICA
Defenders of Soil, Air, Woods, Waters and Wildlife

TESTIMONY FOR SENATE HEARING ON THE 1990 FARM BILL COMMITTEE ON AGRICULTURE, NUTRITION AND FORESTRY

March 29, 1990
Washington, D.C.

Submitted by
IZAAK WALTON LEAGUE OF AMERICA

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CONSERVATION, SUSTAINABLE AGRICULTURE AND THE 1990 FARM BILL

The Izaak Walton League of America (IWLA), is a conservation organization representing more than 50,000 members nationwide. IWLA was founded in 1922 by a group of Midwestern anglers concerned with water pollution in the Mississippi River watershed, primarily caused by soil erosion related to farming activities. Ever since, IWLA has been involved in soil and water conservation issues, and a majority of our members still hail from the nation's agricultural heartland.

In 1990, the Izaak Walton League urges Congress to revise federal farm programs to maximize conservation of natural resources through partnerships with farmers and rural landowners that first and foremost encourage prevention of environmental problems. We encourage Congress to follow through on laws initiated in 1985 that remove publicly funded subsidies for environmental degradation. We also ask that regulatory measures be considered when voluntary actions are clearly not sufficient to protect environmental quality.

IWLA strongly supports the Conservation Reserve Program (CRP), which should be funded to reach a 45-50 million acre enrollment. New signups should be targeted to the off-site impacts of erosion on water quality, along with wetlands protection, and planting of trees and field windbreaks. Permanent easements or extended CRP contracts should be offered for the most environmentally sensitive acres coming out of the program at the end of ten years. In addition, when the CRP expires, the land should be treated to keep soil erosion at tolerable levels for landowners to be eligible for farm program benefits.

The complement to the CRP's generous enticement for stewardship must be a strong set of conservation provisions -- swampbuster, conservation compliance and sodbuster. These measures remove publicly financed incentives to produce commodity crops on wetlands and to farm highly erodible land without adequate erosion control.

IWLA also supports the conservation easements mandated for the Farmers Home Administration. These innovative programs protect ecologically vulnerable areas on government owned properties, and allow financially strapped U.S. farmers to exchange indebtedness for environmental protection. Though the FmHA easement programs have had disappointing results, their potential for cost effective resource protection is immense.

There is also the excellent Low Input Sustainable Agriculture (LISA) research program. This tiny program, which funds research and demonstrations of farming methods that serve both the farmer's pocketbook and the environment, should be expanded to meet the growing demand.

Together, these 1985 initiatives represent a major step towards guaranteeing that our farming system does not exhaust the resource base upon which rural and urban dwellers depend. But there is more to be done in 1990 if we are to enter the next century with sane agricultural policies that sustain both natural and human resources. New initiatives in 1990 must emphasize the basics, such as encouraging farming methods like rotations that protect and enhance the environment, while reducing dependence on purchased inputs that potentially contaminate water supplies, threaten public health and poison wildlife.

While farmers as a whole resist regulations and fear new paperwork requirements, many are taking environmental concerns very seriously. Some have practiced resource conservation for years, even though it may have meant doing without the security of government programs. Other landowners are responding anew to information about the extent of soil erosion, wildlife losses, and potential contamination of drinking water from fertilizers and agricultural chemicals. Many other farmers say they want to make changes on their farms, but hesitate because of commodity program barriers or lack of research-based information.

We are at the beginning of a learning curve that can bring a much greater degree of environmental sustainability to mainstream farms. The government's response should be threefold:

1. to encourage stewardship through creative incentives, and technical assistance,
2. to refuse to subsidize resource degradation, by supporting swampbuster, sodbuster and conservation compliance, or other similar measures and,
3. to modify the commodity programs so that they no longer discourage environmentally responsible farming practices.

The following points outline in greater detail, the Izaak Walton League's positions on priorities for the 1990 Farm Bill:

Conservation Reserve Program (CRP)

Maintain the Conservation Reserve Program, but expand the goal to 45-50 million acres, selectively focusing on acres that have the greatest potential for off-site impacts from erosion, and other uniquely environmentally sensitive cropped lands. Such situations may include areas around sinkholes or agricultural drainage wells, small wetlands, and filter strips (allowed in the CRP now). These special conservation practices should be eligible without requiring the whole field to be under contract.

Congress should direct USDA to emphasize water erosion problems for CRP eligibility, thus achieving better geographic distribution. Wheat base acres enrolled could be limited to specific cover practices, including tree planting, windbreaks, wetland restoration or buffer strips.

Apply sodbuster to all lands coming out of the CRP. For the landowner to be eligible for farm program benefits, any CRP acreage that is farmed after the contract expires would have to meet T, the estimated soil loss tolerance level.

Offer a tree bonus in the Midwest to provide added incentive for this conservation practice where it is most needed. The bonus might take the form of extra cost-sharing to pay establishment and early maintenance costs, or extended contracts for tree planting. Pastureland could be allowed into the CRP for tree planting contracts.

Develop a permanent easement program targeted to the most environmentally sensitive land. Permanent easements provide long-term protection, often for not much more money than 10-year contracts. As in the Administration's proposal for CRP, producers who give permanent easements for wetlands should be able to receive their entire payment up-front.

Do not allow haying and grazing or other cropping on acreage under CRP contracts, although some economic uses should be allowed that are more consistent with CRP program goals of enhancing wildlife habitat. Forage crops can be managed in a manner compatible with wildlife, but to do so requires extra planning, management and monitoring that is unlikely to take place on a widespread basis.

Wetlands Conservation: Incentives and Swampbuster

Expand the Water Bank Program (WBP). This 10-year reserve program pays landowners not to drain or alter existing wetlands that are identified as prime waterfowl habitat, primarily in the Prairie Pothole region. WBP should be enlarged to include more areas where important wetland resources have a high potential for drainage or degradation.

Consideration should also be given to modifying the WBP so that some contracts could be offered for easements longer than 10 years, including permanent easements.

Maintain the cropped wetland option in the 10-year Conservation Reserve Program (CRP). This opportunity improves the program's benefits to water quality and wildlife. However, the wetlands retirement option should give more attention to restoration of wetland character on enrolled acreage to make sure taxpayers receive maximum return for their investment.

Maintain swampbuster, and strengthen the law to make drainage the violation rather than subsequently planting a commodity crop.

Refine swampbuster's existing minimal effects exemption to provide needed flexibility for farmers without creating additional loopholes.

Reduce penalties for first-time swampbuster violators who restore the wetland.

It is estimated that farm-related drainage still accounts for 80 percent of wetland losses. If any wetland protection goals are to be met, swampbuster is absolutely vital to ensure that government farm programs do not continue to subsidize drainage.

Highly Erodible Land: Conservation Compliance and Sodbuster

Reinstate T as a basic program objective for compliance, and set an upper limit on allowable soil erosion. Erosion above the T to 2T level should only be permitted where there is a legitimate hardship associated with meeting the basic standard.

Change commodity program provisions that conflict with compliance and sodbuster. Current commodity program rules discourage soil sustaining farming practices such as crop rotations.

Strategic Forage Reserve and Vegetative Cover on Annual Set-asides

Require USDA to institute multi-year set-aside contracts as a strategic forage reserve. A certain amount of land taken out of production each year would be required to be planted to appropriate intermediate-term cover (three to five years) that would protect soil and water, and provide wildlife benefits, while securing an emergency supply of forage for livestock in the event of drought or other emergency.

Cost sharing should be provided to help compensate farmers for timely planting of legume or warm season grass cover on multi-year set-asides.

In addition, all acres in annual set-asides or diversion programs should be required to have appropriate vegetative cover to protect the land from erosion.

Commodity Programs

Implement a voluntary low-input sustainable agriculture program to reward farmers who use sustainable practices and to encourage others to move in that direction. Legislation introduced last year by Senator Wyche Fowler (D-GA) and Representative Jim Jontz (D-IN) would create such a program. Participating farmers would develop five-year farm plans, which by the end of the period would substantially reduce chemical use and hold soil erosion to rates that do not threaten long term soil productivity. Participants' payments could not be reduced during the five-year transition period.

For farmers with low farm program "bases" due to historic use of soil-building rotations, the Jontz bill would increase crop bases so that the farmer's deficiency payments would be based on the county average yield.

Redirect farm program payments so that sustainable farmers with rotations that include soil-building crops receive, at a minimum, payments equal to those received by continuous corn and wheat producers. Farmers who traditionally have used such practices should have their farm base adjusted upward.

Establish a two-tiered target price system with a limit placed on the volume of farm production that would be publicly supported at the higher rate. This would save public funds and free up money for stewardship incentives, and would also more effectively direct farm program benefits to family-sized farms. Eligibility for the higher target price should be phased out as farm household's total income (farm and nonfarm) exceeds twice the national median income.

Deficiency payments -- the amount paid by USDA to producers to compensate for low market prices -- should be based on no more than $80,000 to $100,000 worth of program commodities.

Protect "base" payments only for "flexible" changes in crops or rotations that move farming operations only in the direction of increased environmental sustainability. Flexibility should not be designed to encourage more erosive or chemically intensive practices, such as continuous planting of soybeans.

Study the feasibility of establishing a yield system for determining farm program payments that is based on land capability and productivity. USDA should prepare a report on different ways that commodity programs could be redesigned to establish a realistic, sustainable yield for each farm. Technology is now at the point where USDA could develop a formula using factors like soil types, climate, rainfall and irrigation to figure reasonable yields for farm program payments. Currently, farm "base" is often based more on politics than reality, and encourages resource-depleting practices in order to reap high tax subsidies.

An alternative would be to develop a modified county average yield. Average yields would be calculated for major land classifications within a county based on existing SCS soil maps.

Farmer's Home Administration (FmHA) Conservation Easements

Continue to require Farmer's Home Administration to place easements on environmentally sensitive lands that are in the agency's inventory under Section 1318 of the 1985 Food Security Act. This should include properties that will be sold back to previous owners.

The agency should be instructed, however, to reduce the selling price of such property in a reasonable manner based on any reduction in value from such easement.

Require FmHA to give higher priority to Section 1314 conservation easements when helping struggling borrowers restructure existing delinquent farm loans.

New farm borrowers should also be allowed to exchange conservation easements for initial up-front debt relief, recognizing that protection of environmentally sensitive land represents long-term savings to society.

Research and Extension

Increase funding for the Low-Input Sustainable Agriculture Research Program (LISA) to $50 million per year, from its current $4.45 million. The program should be reauthorized in the farm bill with language requiring active involvement of farmers and nonprofit sustainable agriculture organizations in its administration.

On-farm research and demonstration activities with active farmer involvement should receive be emphasized.

Increase "systems" research on topics related to agroecology. Such research aims to gain a better understanding of the interactions and relationships between living systems and farming practices.

There should also be increased research on farming strategies during climate change, farming systems and methods that save energy or utilize renewable energy, and new uses for soil conserving/building crops.

Wildlife Management Institute

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Statement of Eric W. Schenck
before the
Subcommittee on Conservation and Forestry
Senate Committee on Agriculture, Nutrition and Forestry
on
Conservation Provisions for the 1990 Farm Bill
March 29, 1990

Mr. Chairman:

I am Eric W. Schenck, Director of Conservation for the Wildlife Management Institute. The Institute, a private, nonprofit conservation organization, has been dedicated to improved natural resource management since 1911. We appreciate the opportunity to express our views and recommendations on conservation needs and provisions for the 1990 Farm Bill.

The 1985 Food Security (Farm) Act has become landmark legislation through its unique approach to integrate new conservation dimensions into federal food and fiber commodity programs. The Institute's recommendations today seek to continue and improve upon the pioneering provisions of the 1985 Farm Act, and authorize, where needed, new features to place agricultural land and water uses on a more sustainable basis. These recommended changes are designed to be, where possible, largely less costly than current agricultural programs or budget neutral.

Conservation Reserve Program

The Conservation Reserve Program (CRP), arguably a hallmark of the 1985 Farm Act, has proven to be a cost-effective way to reduce soil erosion. Recent changes to restore cropped wetlands and floodplains in the 10-year program have demonstrated that CRP can be equally effective in addressing other resource concerns.

The Institute recommends that the CRP be broadened to include multiple conservation purposes with enrollment expanded beyond 40-45 million acres, if necessary, to meet national conservation objectives. Expanded CRP purposes should include areas vulnerable to surface or groundwater contamination, previously drained wetlands that have been converted to agriculture, and areas to be planted to trees, particularly windbreaks and shelterbelts. Additional incentives, such as 15-year contracts and 75 percent cost-sharing are needed to encourage establishment of windbreaks/shelterbelts and other valuable practices.

When expanding the CRP, the Institute recommends that rather than establishing predetermined acreage goals, the current cap be increased to 65 million acres and an appropriate "trigger" mechanism be designed to allow additional enrollments subject to agricultural production needs. We suggest that the "trigger" require a minimum of 60-80 percent of the total acreage set-aside (in CRP, ACR, and 0/92) in the U.S. in any given year be enrolled in the CRP, thus allowing the CRP to grow with annual set-aside needs.

Additional changes are needed to establish a lasting CRP legacy. First and foremost is removing misaligned incentives that encourage plow-out. New provisions must be developed that protect CRP lands under no-net-loss soil erosion (sodbuster) regulations and that address base acreage on CRP lands. Allowing the use of commodity subsidies and inadequate soil conservation plans to bring CRP lands back into production after taxpayers have spent billions of dollars to protect these fragile lands would be a national disgrace.

Greater attention needs to be given to using conservation easements to build a lasting conservation legacy. Conservation easements are a valuable tool for protecting wetlands, forest lands, or other environmentally sensitive lands in perpetuity. In designing authority for acquiring easements, opportunities to develop cooperative partnerships with states, such as establishing federal/state matching requirements for funding, should be considered. In addition, easement programs should be linked with the CRP to capitalize on future annual budget savings when CRP contracts begin to expire.

Multiyear Set-Asides

The Institute strongly supports the Administration's proposal to establish multiyear set-asides by requiring land entered under annual programs to be established in protective perennial cover. While the Institute shares with the Administration the recommendation to limit cost-share assistance to 50 percent of the set-aside acreage, we strongly recommend that protective vegetative cover requirements apply to all (100 percent) of the set-aside area. That requirement would be responsive to curtail soil erosion, improve water quality, enhance fish and wildlife habitats, and benefit the capital land resources of landowners.

Conservation Compliance

As of January 1, 1990 the Soil Conservation Service (SCS) had completed nearly all of the conservation plans covering some 140 million acres of highly erodible lands as required by conservation compliance provisions of the 1985 Farm Act. Nearly two-thirds of these plans rely largely on crop residue management techniques, many of which may be unrealistic from an agronomic and technical point of view and will fail to achieve sustainable levels of erosion control.

The Institute recommends that conservation plans for all highly erodible lands require sustainable, farming practices to achieve no-net-loss soil erosion and maintain soil productivity. In special cases where producers can demonstrate through an appeals process that farming practices required to reduce soil erosion to soil loss tolerance ("T") levels are not technically or economically feasible, alternative conservation systems that reduce soil erosion by at least 50 percent and have a maximum erosion rate of "2T" may be allowed.

Sodbuster

Sodbuster provisions of the 1985 Farm Act were designed to discourage the use of commodity subsidies in breaking out native grasslands. Current loopholes in Sodbuster now allow producers to receive annual payments from CRP while simultaneously converting marginal grasslands to more intensive uses (e.g., croplands, etc.). In some parts of the northern Great Plains, producers have routinely enrolled existing cropland in the CRP and expanded their operations by converting thousands of acres of native prairie. These producers may continue to receive federal farm program benefits, including CRP payments, as long as the Sodbusting is done according to an SCS approved conservation plan. For example, in a five-county area of Montana, more than 56,000 acres of native prairie have been Sodbusted by farmers since 1987. One-third of these producers also had enrolled highly erodible land in CRP.

The net result has been a perverted incentive created by CRP to convert additional native grasslands to commodity crop production. This loophole, contradicting the intent and purpose of both CRP and Sodbuster, must be resolved.

Swampbuster

Swampbuster provisions in the 1985 Farm Act took a dramatic and much-needed approach to remove agricultural subsidies leading to drainage and destruction of wetlands. However, Swampbuster also contains several weaknesses that have hampered its ability to halt destructive wetland losses.

Chief among those weaknesses has been the inequitable "all or nothing" loss of farm program benefits associated with Swampbuster violations. This feature has eroded enforcement efforts of local Agricultural Stabilization and Conservation Service (ASCS) committees. In addition, loopholes now exist that enable those who drain wetlands to avoid any Swampbuster penalty altogether.

The Institute recommends that graduated penalties be established for first-time, first-year Swampbuster violations. Such a penalty could be based on a sliding-scale fee commensurate with the acreage and value of wetland drained (e.g., $300 per acre), with a provision that the producer's total farm program benefits would be reduced by at least some acceptable percentage (e.g., 25-50 percent). Producers would then be given one year to restore the drained wetlands to standards set and approved by the U.S. Fish and Wildlife Service. If the producer failed to restore the wetland during that time period, full violation of Swampbuster would occur and the producer would be denied all subsequent farm program benefits.

This sensible approach would enable local enforcement of Swampbuster penalties fully and without apprehension of simultaneously forcing significant financial hardship on producers. The U.S. Fish and Wildlife Service would play a stronger role in Swampbuster by approving wetland restoration. Producers having inadvertently violated Swampbuster also would be given a second chance to restore the wetland before losing all farm program benefits.

Through the administrative rule-making process, the Secretary of Agriculture delegated authority for enforcing implementation of Swampbuster to ASCS committees. These locally elected committees of farmers are being asked to make Swampbuster decisions for which they have little or no technical background and that may be unpopular with friends and neighbors.

To guarantee greater consistency, credibility and accountability of Swampbuster wetland conservation decisions, the Institute recommends that local USDA professionals be responsible for primary Swampbuster enforcement. In addition, formal producer/nonproducer appeals of local Swampbuster decisions should be reviewed and decided by state advisory boards established under the Agriculture and Consumer Protection Act of 1973 or other technical review committees that include wetland resource professionals (e.g., U.S. Fish and Wildlife Service and state fish and wildlife agencies).

Another problem is the fact that currently Swampbuster does not penalize a farmer for draining or otherwise manipulating a wetland. Only in a year when a commodity crop is planted on the drained wetland is a producer at risk of losing farm program benefits. Clearly, to be effective Swampbuster must discourage wetland conversion, not merely crop production. The integrity of wetland basins should be maintained.

Finally, the Institute strongly recommends that wetland definitions pertaining to Swampbuster not be changed to categorically exempt temporary wetlands or diminutive size wetlands with a cropping history. Accumlated evidence indicates that current Swampbuster definitions are acceptable to farmers in areas where SCS has completed wetland determinations. Only in areas where determinations have not been made and farmers remain uncertain about the potential impact of Swampbuster on their operations do concerns about cropping history exemptions persist.

New changes in wetland definitions, now that nearly half of all Swampbuster wetland determinations have been completed, would be an unprecedented mistake and require significant duplication of effort. Such a change ignores the effectiveness of minimal effect policies, as being applied currently with concurrence from the U.S. Fish and Wildlife Service and incorporating on-site mitigation, in dealing with "nuisance" wetland areas. It also ignores the working wetland definition accepted and used by four federal agencies (including USDA) and would unnecessarily jeopardize a valuable segment of the Nation's wetland resource.

FmHA Conservation Easements

The Farmer's Home Administration (FmHA) was given a rather unique opportunity to protect wetlands under the conservation provisions of the 1985 Farm Act. Section 1318 authorizes FmHA to assist financially troubled farmers by allowing them to cancel a portion of their delinquent debt in exchange for 50-year or longer conservation easements. Section 1314, in conjunction with Executive Orders 11988 and 11990, places an affirmative responsibility on FmHA to establish conservation easements on wetland properties held in FmHA inventory before they are resold, leased or transferred.

Response to FmHA's debt-for-easement program has been disappointing. For nearly 3 years FmHA stalled implementation of this program. Then, changes were made by Congress in the 1987 Agricultural Credit Act, which allows delinquent borrowers to write-off debt owed to FmHA rather than exchange it for a conservation easement. As a result, FmHA has forgiven more then $1.8 billion of debt owed by approximately 9,600 borrowers--an average of $188,365 per person--through debt write-downs and buy-outs at net recovery. Another 42,000 requests are still pending. In sharp contrast, FmHA has used conservation easements to help farmers resolve their debt problems in fewer than 5 cases.

FmHA also is not fulfilling its responsibility to use easements for protecting wetlands on federal inventory lands (lands conveyed by farmers and held by the agency). The Fish and Wildlife Service has made more than 1,200 easement recommendations covering about 200,000 acres of FmHA inventory property. FmHA has finalized less than 200 of these recommendations.

Another 300,000 to 500,000 acres of wetlands are projected to come into FmHA inventory over the next couple of years. FmHA is considering proposals to change its regulations to make conservation easements on these properties a voluntary decision of the prior owner.

The Institute recommends that Congress and FmHA view conservation easements as valuable assets and a potential form of loan collateral, separate from land ownership. FmHA should then give highest priority to using conservation easements to help struggling borrowers restructure existing delinquent farm loans, and allow new farm borrowers to exchange conservation easements for up-front debt relief so as to avoid becoming delinquent in the future.

Conservation easements voluntarily exchanged by farmers for up-front debt relief have the potential of breaking the cycle of continued FmHA farm loan losses. By assisting farm borrowers *before* they become delinquent, conservation easements will better enable borrowers to pay back their loan obligations to FmHA and graduate more quickly to commercial sources of credit.

For FmHA borrowers who become delinquent on their farm loans, exchange of delinquent debt for conservation easements should be *required* before allowing borrowers to simply write-down delinquent debt or buy-out their loan at net recovery value. This proposal is consistent with the Administration's recommendation to require borrowers to liquidate or sell other assets before qualifying for loan restructuring. Used in this way, FmHA can assist farm borrowers in resolving debt difficulties while, at the same time, protecting the public interest by acquiring conservation easements on valuable wetlands or other environmentally sensitive lands.

Finally, FmHA should require conservation easements as collateral for all newly issued, insured or guaranteed loans. Under FmHA guaranteed loan program taxpayers stand to loose up to 90 percent of guaranteed loan amounts, should borrowers default, with no federal claim to secured property. By requiring conservation easements to be used as collateral, FmHA would hold some secured interest in every farm loan it makes, insures or guarantees whenever wetlands and other environmentally sensitive lands are involved. Public resource values and taxpayer interests would become a condition of FmHA loans, not an after thought.

NARA
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WRITTEN STATEMENT
OF THE
NATIONAL AGRICHEMICAL RETAILERS ASSOCIATION
SUBMITTED TO THE
SUBCOMMITTEE ON CONSERVATION AND FORESTRY
OF THE
SENATE AGRICULTURAL, NUTRITION AND FORESTRY COMMITTEE
REGARDING THE
CONSERVATION TITLE OF THE 1990 FARM BILL

MARCH 26, 1990

(SUBMITTED FOR THE RECORD)

Mr. Chairman and Members of the Subcommittee, as the only independent national trade association representing crop protection chemical retailers, the National AgriChemical Retailers Association (NARA) welcomes the opportunity to comment on the Conservation Title of the 1990 Farm Bill. Our membership consists of 1,150 dealers who handle the majority of crop protection chemicals sold in the United States.

Being on the "front lines" with farmers each day, a chemical dealer, more than any one else, realizes the responsibility and care he must take in providing farmers the necessary inputs to make their farm economically viable and environmentally sound. If we make a mistake, we can't hop in our truck and travel to the next state, we live and work with our farmer customers each day. Working to keep our farmers in business is what keeps us in business.

Our members can tell you honestly that they have no desire to be in your position this year. The public, being bombarded with stories about pesticides, from so called public interest groups, has become confused and scared about the safety of our food and environment. Today, we want to bring to you the views of agrichemical dealers regarding proposals that have been made to modify the 1990 farm bill and to address some of these public concerns.

I. Amendments to the Conservation Reserve Program (CRP)

We believe that the Conservation Reserve Program (CRP) has achieved many of its goals since implementation in the 1985 Farm Bill. Soil erosion has been reduced, water quality improved, wetlands protected, and wildlife habitat enhanced. Since 1985, 34 million acres of land has been signed-up for the program.

NARA recommends that Congress extend the CRP sign-up through 1995. In the extension of the program, we ask that Congress hold the total acreage at 40 million. However, we request that the remaining acres be targeted toward the most environmentally sensitive areas. These areas include filter strips, windbreaks, wetlands, and well heads.

From a dealer's perspective, any large increase in acres retired from production in order to meet supply and demand issues, directly effects our livelihoods. In certain agriculturally based counties where 25% or more of the farm land has been placed in the CRP; agribusinesses, banks, and entire communities have literally dried up and blown away. Targeting CRP acres for environmental purposes, while holding the total reserve at 40 million acres will, in our opinion, attain the supply/demand and environmental objectives that you in Congress are trying to achieve.

II. Ground and Surface Water Quality

A large percentage of crop protection chemical retailers from across the country have already begun to make their facilities environmentally sound. Hundreds of millions of dollars have already been invested by our industry to construct diking, rinse pads, and other structures to contain potential spills and leaks of agrichemicals that could affect ground water. Addressing point-source contamination has, and will continue to be our number one priority, until every agrichemical dealership in the United States is environmentally secure. Also, under the Federal Insecticide, Fungicide and Rodenticide Act Amendments of 1988, the U.S. Environmental Protection Agency is now in the process of writing the most comprehensive regulations regarding dealer facilities ever undertaken.

In order to address the question of non-point sources of pesticides and ground water contamination, the USDA, EPA, other government agencies, and our industry as a whole, have been trying to answer the question of just how pesticides, under normal or label rate conditions, reach the ground water. As you probably know, this question is one that is scientifically very difficult to answer.

To help address this question, the EPA is currently on the verge of completing the National Pesticide Survey, the first nationwide study ever undertaken to determine a profile of pesticides in well water. From preliminary results, the number of pesticide detections has been very low, and the number of detections over the EPA's Health Advisory Level (HAL) have been even lower.

Although the USDA and EPA feel that agricultural chemicals are not yet a serious health problem in ground water, we recognize that present findings, such as those in the National Pesticide Survey, call for continued and coordinated federal, state, local and individual efforts to insure that potential ground water contamination problems do not occur in the future.

We would like to point out a few things that the federal government is doing to further coordinate its efforts on ground water at this time. On November 1, the USDA established a policy-level working group on water quality. The primary purpose of this group is to coordinate all USDA water quality issues and activities, including research, information, education, technical assistance, financial assistance, and regulatory aspects.

In addition to the USDA's in-house coordination, there is a new spirit of cooperation among all federal agencies. A number of interagency committees, including the Committee on Earth Sciences, are now focusing on environmental issues, including ground water. The USDA is also working with the United States Geological Survey (USGS), the nation's Land Grant University System, and implementing educational and technical assistance programs designed to help farmers understand and take advantage of farming practices that are more environmentally friendly such as Integrated Pest Management (IPM), Biological Controls, Sustainable Agricultural Practices, and Best Management Practices.

We feel that the many new government initiatives in the area of ground water and a budget that has doubled over the past three fiscal years to $155 million, adequately address the ground water issue. No new federal regulations are needed in the 1990 Farm Bill other than to provide farmers with additional information on how to protect ground water, target CRP acres, and give farm program base flexibility to address the ground water issue.

III. Protection of Wetlands

Wetlands are one of our nation's most valuable resources. Since the 1985 Farm Bill, over 400,000 acres of wetlands have been enrolled in the CRP. Also, wetlands are being protected under the Water Bank Program, the Clean Water Act's section 404 Wetland Permit Program, and the Swamp buster Program.

We support efforts to target wetland protection in the 1990 Farm Bill by providing for an extension of the CRP sign-up for which contracts may be entered into for the purpose of restoring cropped wetland as long as these sign-ups are voluntary. However, before Congress expands upon the current wetland programs, I think it would be of great benefit to farmers, and the success of the program, if the USDA more precisely defines what constitutes a wetland. Farmers also need a better description of how land surrounding a wetland will be affected by the program before they will sign-up.

IV. Alternative Agriculture

Much has been said over the past few years about low-input or alternative agriculture, even a 449 page report entitled "Alternative Agriculture" was released by the National Research Council (NRC) this past year on the subject. Even though the report supported the benefits of alternative agriculture, the aggregate effects of alternative agriculture need to be evaluated in the context of market forces and government policies that determine farm profitability.

Many alternative agricultural production practices are already being used by farmers, when they fit into his operation, based on soil type, slope, cultivation practices, crop variety, farm economics and the weather. For example, some farmers Georgia use Integrated Pest Management (IPM) on their soybeans. IPM requires a high level of labor and management. Farmers use trained field scouts to comb the fields and apply pesticides only when insects reach the economic threshold control level. However, when soybean prices dropped below five dollars per bushel, farmers discontinued crop scouting, an essential component of IPM. At present, alternative agricultural practices require government incentives to make them work.

Another real-world example of alternative agriculture is in California. A major vegetable farm near Salinas has devoted 25% of its lettuce production to non-chemical alternative agricultural production practices. Instead of using crop protection chemicals, they used the Salad-Vac, a machine which vacuums insects right off the plant and other alternative agriculture practices. However, the vegetable farm found that it cost an additional $400 dollars per acre to grow lettuce using alternative agricultural.

We support continued funding of the USDA's research in the area of alternative agriculture. We also support flexibility in crop acreage bases in order to allow farmers to plant legumes, grasses, or conserving crops as part of a sustainable agriculture rotation while at the same time protecting their base history. However, we do not support congressional mandates that would force farmers to reduce agrichemical use by 20% or more in order to receive deficiency payments. Until proven alternatives are found for crop protection chemicals and fertilizers, Congress should not jeopardize the livelihoods of the american farmer or his ability to produce large quantities of high quality foods in order to please special interest groups. If Congress wants some real information on how a huge agrarian system works under a low input, alternative agricultural system, they have to look no further than the Soviet Union and Eastern Europe where food shortages abound, long food lines persist, and a poor quality diet is an everyday fact of life.

V. Acreage Reduction Programs

The Acreage Reduction Program (ARP) and the Paid Land Diversion Program (PLD) should be carefully implemented in the 1990 farm bill. Agriculture needs consistent programs to assure that farmers can utilize their management skills to produce a crop in an environmentally sound manner. Annual changes in crop acreage add confusion and lower the priority of environmental programs for both farmers and agribusiness.

Requiring farmers to establish a annual or perennial cover crop on annual set aside acres will, in essence, require them to invest large sums of money into acres from which they will receive no income. Unless the federal government can provide some real incentive for establishing a cover crop on annual set-aside acres, we don't think farmers will participate in the program. If, on the other hand, farmers are forced to establish cover crops in order to stay in the program, Congress will continue to lower the profit margin for farmers causing more to go out of business.

VI. Environment and Trade

Congress, in writing the 1990 farm bill, must carefully evaluate environmental regulations which weaken our world market position by lowering output and increasing production costs. Countries such as Brazil, don't have expensive environmental regulations to contend with, however we must compete with them each day on the world market. Congress must formulate trade policy which establishes an environmental balance with other countries. In essence, this policy would tie the added expense and reduced output caused by our environmental regulations, to the quantity of agricultural commodities that we allow to be imported from countries with no environmental regulations. Also, our export subsidies should be adjusted to take into consideration differentials in production cost and yield advantages of other exporting countries so we can continue to compete on the world market.

America's farmers, with the current infrastructure provided by agribusiness, can produce with any other exporting nation. We cannot, however, saddle them with environmental restrictions and expect them to remain competitive in the world market. Congress must achieve an agricultural policy in the United States that will protect our producers in light of the regulations that you choose to impose. Like many other decisions in a complex world, both sides must be balanced to protect the environment and save the farmer.

VI. Conclusion

The retail crop protection industry is concerned about the environment and believes that if the government continues to provide farmers with good information about production alternatives, gives them farm program flexibility, and targets sensitive areas, we can all achieve a more sound environment.

We would like to thank you again for allowing us to submit written testimony today. If you should have any questions regarding our testimony, please let us know.

Senator **Fowler**. We stand adjourned.

[Whereupon, at 5:50 p.m., the subcommittee adjourned, subject to the call of the Chair.]

[Material submitted for inclusion in the record follows:]

APPENDIX

PREPARED STATEMENT OF SEYMOUR JOHNSON, CHAIRMAN, DELTA COUNCIL FARM POLICY COMMITTEE

Thank you Mr. Chairman for allowing us to appear before you today. My name is Seymour Johnson and I am a farmer and businessman from the Mississippi Delta where we produce approximately 70 percent of our State's agricultural products. I appear before you today representing Delta Council, an organization of agricultural, business, and professional leaders from an 18-county area in northwest Mississippi.

The conservation and management of our region's natural resources has been a top priority of Delta Council since the organization was founded in 1935. In fact, active soil and water resource conservation organizations are working at the local level to effectively maintain these natural resources in our area, and this past year, we levied an additional local tax throughout our region to establish a water management district to outline and implement future management strategies for the vast ground water and surface water resources of our area.

In 1985, Congress altered the direction of future soil and water conservation efforts by coupling compliance eligibility with conservation parameters that were enacted through the Food Security Act of 1985. Although many have questioned whether the spirit of the law has been expanded beyond the original intent which Congress enacted in December 1985, on balance, the law has served as a positive step toward improved maintenance of our natural resources.

Administratively, there are numerous clarifications and amplifications of the current law that should be given attention by the Congress during deliberations for the 1990 farm legislation. Specific attention should be given to those situations which prevent the Soil Conservation Service from exercising needed flexibility when dealing with Swampbuster provisions associated with improved drainage that is sought by public bodies. Public facilities and services that are located within an area that experiences inadequate drainage should be allowed the opportunity to make the necessary drainage improvements without impacting compliance of adjacent croplands.

Delta Council would like to praise the work by Chairman Fowler in an effort to develop a responsible and reasonable approach toward the conservation title of the 1990 farm bill. Delta Council leaders have reviewed the major provisions offered in Senator Fowler's conservation proposal and we feel that it is conceptually sound. With specific reference to the considerations given to amending the Swampbuster provisions, we would point out that the Lower Mississippi River Valley, consisting of the Mississippi River floodplain in seven States, is dramatically impacted by compliance with wetlands provisions. It is critically important to the agricultural industry throughout this seven-State region, including the Mississippi Delta, for a practical application of the Swampbuster provisions to be applied. While it may seem relatively harmless to regulate wetlands throughout farm program compliance, we have seen that the interpretation of Swampbuster provisions can very easily translate into rigid and inflexible rules that do not contribute any meaningful gains to wetlands conservation. We feel that "prior converted" wetlands should not be exposed to compliance for farm program purposes. "Farmed wetlands" and relatively small tracts of "wooded wetlands" should be measured by their true, ecological value as a part of the total wetland ecosystem of an area, prior to imposing strict Swampbuster adherence on an individual farming operation. In many cases, we have found that arbitrary standards have been set to determine the actual value of certain wetlands, and thus property owners have been forced through compliance to adhere to impractical wetlands conservation goals.

In general, Delta Council would like to commend the chairman and the staff for identifying a reasonable approach toward achieving support from our Nation's farmers for soil and water conservation objectives. Thank you for affording us the opportunity to submit this testimony.

Respectfully submitted,

SEYMOUR JOHNSON,
Chairman, Delta Council Farm Policy Committee.

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AGROECOLOGY PROGRAM
BOARD OF ENVIRONMENTAL STUDIES
DIVISION OF SOCIAL SCIENCES

SANTA CRUZ, CALIFORNIA 95064

February 13, 1990

Ben Yarbrough
Office of Wyche Fowler, Jr.
U.S. Senate
Russell 204
Washington, DC 20510

Dear Ben:

Enclosed are some of the materials I have sent to Senator Fowler's office over the last several years. Sustainable agriculture and the 1990 Farm Bill have been the focus of my research here at U.C. Santa Cruz for the last three years.

I attended the hearings in Davis this past Friday. A number of good points were made by those testifying. Most of the additional points I would like to indicate are contained in the enclosed correspondence that I sent to Senator Fowler in November, 1988. This correspondence was in response to his request for an analysis of his S.2898 introduced in 1988.

I am available to testify in hearings in California or Washington, D.C. concerning the Farm Bill and sustainable agriculture. In addition to my academic work in this area, I am also an organic wheat grower in the USDA commodity program, so I am very familiar with the intent and reality of what the Farm Bill means to the agricultural sector. I appreciate your keeping me in mind for future hearings.

Sincerely,

Jackelyn Lundy
Associate Director

JRL/jg
encl

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Agroecology Program
Board of Environmental Studies
Division of Social Sciences

SANTA CRUZ, CALIFORNIA 95064

14 November 1988

Senator Wyche Fowler, Jr.
Conservation and Forestry Subcommittee
Senate Agriculture Committee
United States Senate
Washington, D.C. 20510

Dear Senator Fowler:

Thank you very much for the opportunity to review and comment on your recent bill S.2898. I commend you for initiating such important legislation which could play a key role in addressing the public health and environmental issues associated with high-chemical input agriculture. National legislation is essential in order to develop a comprehensive approach to these issues.

Given the importance of your bill, I have passed it to two of my colleagues, Dr. Stephen Gliessman and Patricia Allen, and have asked them to comment on the bill. Their comments are included in the following statement. If you have any questions regarding these questions, or if there is any other way I can assist you on S.2898, please do not hesitate to call me at (408)429-4540.

Sincerely,

Jackelyn Lundy

Dr. Jackelyn Lundy
Academic Coordinator

cc: Stephen Gliessman
Patricia Allen

JL/km

COMMENTS ON THE FARM CONSERVATION AND WATER PROTECTION ACT OF 1988, S.2898

S.2898 addresses some of the critical issues of public health and the environment associated with the high use of agrichemicals (pesticides, herbicides, and fertilizers). National legislation is essential to address these questions through such programs as the low-input and conservation programs proposed in S.2898. This bill is an exemplary start in implementing such programs. The following comments are suggestions for ways in which the bill could be amended in order to make these programs more effective.

TITLE I - LOW-INPUT AGRICULTURE
Subtitle A - General Provision

(c) Policy: add

(2) (F) increasing the USDA low-input research grants budget to find new and more effective low-input practices.

The new USDA low-input program has begun research into improving the existing low-input systems. This work needs to be expanded and augmented by developing new low-input systems for crops where this technology is not developed.

Subtitle B - Low-Input Farm Program

SEC. III. LOW-INPUT FARM PROGRAM

(a) Given that the intent of this bill reaches beyond the historical farm bill purpose of supply and price stability, its perspective needs to be broadened. Historically, the farm bills have included only a select group of commodities. Future farm bills, however, which are addressing human health and environmental implications of agrichemicals, need to include other crops in order to have an effective impact. Many of the fresh fruits and vegetables are agrichemical intensive and are eaten at a greater rate by consumers than commodity crops. The agrichemically intense production methods used by these crops also can have more extensive per-acre environmental implications. If limited resources mandate a limit to the number of new crops included, a priority preference could be given to the most per-acre chemical intensive crops first.

(b) (1) Development of Plans

The Soil Conservation Service is the most effective organization to carry out this program because of its mandate and connection with growers, but very few field agents for SCS have any background or knowledge in low-input systems. These agents will need to have training from those knowledgeable in these techniques. Also, they will need to have sufficient resources in terms of printed materials and personnel in order to help implement the program. Unlike conventional agriculture, where suggestions of agrichemical or tillage techniques can be fairly uniform, low-input systems must have managers who are trained to watch for specific ecological indicators. This requires teaching the trainers so they can convey to the farm managers ways in which to watch for ecological indicators for their specific ecosystems. Low-input systems are management intensive, and the farm managers will need sufficient training in order to be effective.

(3) ASCS and SCS will need additional resources to carry out a certification program and will need staff members trained to recognize compliance violations.

SEC. 112. TERMS AND CONDITIONS FOR PARTICIPATING

(a) (1) and (2) Since the point of this bill is to curb agrichemical externalities, the participation requirement of producing commodities during three of the previous five years does not seem germane. The bill's goal should be to sign up as many producers as possible, and additional barriers, such as cropping history and a 50% income requirement, adds nonrelevant obstacles to growers participating in the program. The

50% income requirement is particularly discriminatory against new and struggling farmers, who may rely on off-farm income to maintain their farming operations.

SEC. 115. BASE PROTECTION

(3) The limit of no more than one-third of the base that may be placed in legume rotations places an unnecessary restriction on the grower, and the appropriate allocation of base acreage devoted to rotations should be part of the individual farm plans.

SEC. 116. TECHNICAL GUIDE FOR LOW-INPUT AGRICULTURE

SCS will need assistance from those who are knowledgeable about low-input systems in order to develop a technical guide. This work might be accomplished better through USDA's low-input program, wherein outside experts can be contracted to develop the guide.

SEC. 122. TERMS AND CONDITIONS FOR PARTICIPATION

Same comments as noted for Sec. 112. Terms and Conditions for Participating.

SEC. 124. LOW-INPUT FARM TRANSITION PLAN

(b) (2) The requirement to reach no more than 60% of the crop average seems rather arbitrary. Perhaps a system of graduated incentives could be introduced, wherein if the grower is at 60%, he/she will be paid at 110% of the deficiency payment, at 30% will be paid 125%, and at 0% will be paid 150%.

TITLE III - GROUNDWATER

Subtitle I - Water Conservation

PROGRAM INELIGIBILITY

Sec. 1281. The EPA DRASTIC groundwater ratings would be a useful indicator to use in determining the designated area.

EXEMPTIONS

Sec. 1282. This section should be changed to state that no person shall become ineligible if such person is participating in the low-input farm program.

TITLE IV - EXTENSION SERVICE

SEC. 401. SENSE OF CONGRESS.

This section should be broadened to include USDA, ARS, and the land grant Experiment Stations.

SEC. 402. FARMERS CONSERVATION SERVICE

The Extension Service has very few members who have a background or training in low-input systems. This section should have some flexibility to incorporate those non-Extension researchers into the Conservation Service. Funds should be allocated to hire Extension specialists with expertise in low-input systems, to train existing Extension personnel, and to establish a competitive research grants program that is open to researchers beyond just the land grant schools.

(d) The research priorities should include work on how institutional structures can encourage the adoption of low-input practices (e.g., policies, marketing).

TITLE V - MISCELLANEOUS

SEC. 501. ORGANICALLY GROWN CERTIFICATION PROGRAM

(a) This title switches terms from low-input to organic, and these terms are not interchangeable. More clarification or distinction of terms may help avoid confusion for a general audience.

(b) Enforcement of compliance with the established regulations will be essential to make this program work.

(c) An additional consumer education component should be added to help inform the public so they can create sufficient market demand for organic products.

(d) The term "reduce inputs" is used but not clarified as to which inputs or compared to what other standard.

(e) Trained staff is going to be essential for the effective implementation of this title.

Other comments:

Additional legislation needs to address the high level of pesticide residues in imported produce and other food products. Thsi is a critical food safety issue that is not included in S.2898 and needs to be addressed.

LOW-INPUT/SUSTAINABLE AGRICULTURE AND THE 1990 FARM BILL

Jackelyn Lundy, Ph.D.
Agroecology Program
University of California, Santa Cruz

Paper presented at the Agriculture and Human Values
Conference, November 1989, Little Rock, Arkansas

Introduction

The spectrum of the discussion over agricultural policy has broadened greatly over the last decade. Environmental and health externalities associated with today's high-chemical agricultural production have become more apparent and are driving agricultural policy discussions into new areas. This new attention offers both promise and concern for the agricultural sector.

The increased push to limit agrichemical (pesticides, herbicides, and fertilizers) externalities must be met with a pull of new innovations and policies designed to provide incentives for farmers to adopt profitable production methods that reduce or eliminate chemical inputs. Low-input/sustainable agriculture (LISA) methods have emerged at the forefront of many diverse discussions as a possible solution to the externalities of conventional agricultural production. Growing concerns over issues of human health, environmental degradation, and farm structure have also brought new interest groups into the farm policy debate. Most of these new groups, known as the New Agenda coalition, are urban-based and their perspective on agriculture differs significantly from that of the farm groups that previously dominated agricultural policymaking. They, along with a growing number of agricultural groups, are becoming strong proponents of LISA practices and have targeted the 1990 Farm Bill as a vehicle to implement agricultural policy that includes broader societal goals along with food production goals.

The following paper looks briefly at the transition of U.S. agriculture and agricultural policy, the factors involved in LISA, the actors and issues of the New Agenda coalition, the constraints to adopting LISA innovations, and a suggested LISA program for the 1990 Farm Bill.

U.S. Agriculture and Agricultural Policy in Transition

As the structure of agriculture and the rural sector has changed over the last century, so have the factors influencing agricultural policy. The depopulation of the rural sector since the 1930s has shifted the voting power and political dominance from the "farm block" to the urban areas. By the mid-1970s agriculture and food policies began to attract the attention of new urban-based groups, including consumers, environmentalists, and union groups. These non-agriculturally-based interest groups, commonly referred to as the New Agenda, tend to be concerned with broader social, health, environmental, and long-term sustainability issues, and they are adding to the agricultral policy debate a common good, natural resource conservation perspective. This new perspective and influence is now linking agricultural policy to other areas of public interest, such as food safety, water quality, wildlife habitats, toxics, environmental degradation, and worker safety.

U.S. agriculture has led the world in yields and production innovation. This acclaim has been achieved by U.S. growers' constant search for more efficient production practices. The adoption of agrichemicals by conventional U.S. growers is an excellent example of the theory of induced innovation (Hayami and Ruttan, 1985), which suggests that technical change is motivated by the opportunity to use less of relatively higher priced factors of production. Increasing wage rates, capital costs, and land costs relative to agrichemical prices after WWII help to explain why growers have so extensively incorporated agrichemicals into their production practices. Historical analysis supports this theory; initial increases in agrichemical use were fostered by declines in agrichemical prices relative to crop price, thereby making chemical fertilizers and pesticides cheap substitutes for labor and machinery (Heady and Yeh, 1961).

While induced innovation was a strong impetus in the adoption of agrichemicals, others have suggested it was not the only factor (Youngberg and Buttel, 1984). Other factors, such as farm commodity programs, increasing farm size, specialization, and mechanization created conditions that accelerated the pace of technical change toward agrichemical intensive methods. Thus, the adoption of agrichemicals is argued to be not just a straighforward reflection of farmers to survive without agrichemicals but rather a combination of the relative price of inputs along with the distinctive nature of the agricultural industry and agricultural policy.

The combination of these factors toward adoption of agrichemicals resulted in a substantial shift in production inputs. Between 1950 and 1985, manufactured inputs, interest, and capital consumption expenses as a share of total production cost grew from 22% to 42%, while labor and farm origin input shares declined from 52% to 34% (Daberkow and Reichelderfer, 1988). By 1987, over 95% of corn and soybean acres and over 60% of wheat acres had been treated with herbicides, and 132 pounds per acre of commercial nitrogen was applied to 96% of the corn acreage. Aggregate nitrogen use has more than tripled since 1960, while pesticide use has doubled (see Table 1). Pesticides and fertilizers currently account for 30% to 50% of farmers' production expenses: southeastern cotton farmers may spray chemicals as many as fourteen times in one season (Kinsinger, 1987), strawberry growers spray over thirty times, and sweetcorn growers spray as many as twenty times (Sinclair, 1988).

At the time of the rapid adoption of agrichemicals, the societal and environmental costs of the use of these inputs were not known. Externalities resulting from the use of these inputs are now becoming apparent and are gaining increased attention from a number of nonagriculturally-based interest groups. The concerns expressed by the New Agenda and others are bringing a new level of regulatory interest, from state and federal governments, into the activities of agricultural production. On the federal level, a number of statutes have been passed, such as the Clean Water Act, the Safe Drinking Water Act, and the Federal Insecticide, Fungicide, and Rodenticide Act. At the same time, a number of states such as California, Wisconsin, Iowa, and Nebraska have taken the initiative to enact groundwater protection legislation.

This trend in public policy requires that U.S. growers have alternative production practices available in order to continue profitable operations. Those in research, education, extension, and policymaking positions are beginning to acknowledge this

	Acres Treated with Herbicides			Acres Treated with Insecticides			Acres Receiving Nitrogen Fertilizer			Nitrogen Applied Per Acre			Total Consumption	
	-------Percent-------			-------Percent-------			-------Percent-------			-------Pounds--------			Nitrogen	Pesticides
	Corn	Soybeans	Wheat	Corn	Soybeans	Wheat	Corn	Soybeans	Wheat	Corn	Soybeans	Wheat	Mil. Tons	Mil. lbs.[f]
1960	27[a]	NA	28[a]	6[a]	NA	NA	NA	NA	NA	NA	NA	NA	2.7	NA
1965	57[b]	NA	29[b]	33[b]	NA	NA	88	11	48	75	10	31	4.6	335
1970	79[c]	46[c]	41[c]	35[c]	8[c]	7[c]	96	21	61	112	14	39	7.5	438
1975	93[d]	88[d]	38[d]	38[d]	7[d]	14[d]	94	18	63	105	15	46	8.6	625
1980	93	92	42[e]	43	11	3[e]	96	23	67	130	17	58	11.4	846
1985	96	95	44	45	7	5	97	17	77	140	15	60	11.5	861
1986	96	96	53	41	6	7	96	15	79	132	15	60	10.4	820
1987	96	95	61	41	3	7	96	20	80	132	20	62	10.3	NA

Sources: Osteen, C. and P. Szmedra. Pesticide Use and Productivity Issues, USDA, Econ. Res. Serv., forthcoming; Vroomen, H. Fertilizer Use and Price Statistics, 1960-85, USDA, Econ. Res. Serv., Stat. Bul. No. 750, Feb. 1987; and Environmental Protection Agency, Office of Pesticide Programs, Pesticide Industry Sales and Usage, 1986 Market Estimates and Previous Years.

NA = not available

[a] 1958.

[b] 1966.

[c] 1976.

[d] 1982.

[e] Active ingredients

Source: Daberkow, S. and K. Reichelderfer, (1988).

policy environment and the need to help growers find alternative practices. The drive to reduce agrichemical inputs is being pushed by increased regulation. This push must be matched with a pull of production innovations if growers are to remain profitable.

Low-Input/Sustainable Agricultural Practices

The search for innovative production practices that are not as heavily reliant on agrichemical inputs has focused on alternative agricultural practices that fall under the broad heading of low-input/sustainable agricultural (LISA). Unlike conventional agriculture, LISA methods control weeds and insects by habitat management cultivation and crop rotations and provides crop nutrients with animal manure, other organic matter, and legumes. It largely excludes the use of synthetically compounded pesticides and fertilizers. Agrichemicals are a key component of conventional agriculture and to the extent that chemical pesticides and fertilizers pose environmental problems, LISA offers the potential for reducing and/or eliminating the problems.

A number of different terms, such as organic, regenerative, alternative, low-input, and sustainable have been used to describe agricultural technologies that seek to reduce or eliminate the use of synthetic chemicals, pesticides, and fertilizers (Madden, 1984; Wagstaff, 1987; Lowrance et al., 1986; Crossen, Edwards, Madden, 1988). The first four terms listed above pertain primarily to production practices, whereas "sustainable" encompasses broader concepts. These concepts include sustainability as food sufficiency, as stewardship, as community, and as intergenerational equity. Within these concepts, sustainability can be viewed as agronomic, micro- and macroeconomic, sociological, and ecological. For the purpose of this paper, the most recent definition of LISA from USDA will be used. This definition states the goal as:

"To produce an abundance of safe and nutritious food that is sustainable both economically and physically, and that has positive effects, or at least minimum adverse effects, on human health, natural resources, environmental quality, and rural communities."[1]

A number of potential agronomic, biological, environmental, and social benefits can be derived from instituting LISA practices (Benbrook, 1987). From an agronomic and bioloigcal perspective, LISA can: (1) increase the efficiency of nutrient cycles; (2) foster vigorous plant growth and desirable qualities in harvested crops (sugar content, protein level, taste, etc.); (3) improve stability, reduce the damage from pest interactions, and sustain animal health; (4) increase ability to withstand stress; and (5) match cropping patterns and management systems to the natural potential of soil, water, climate, available labor, etc. From an environmental point of view, LISA can: (1) help control erosion, and foster soil tilth and productivity; (2) conserve water and protect its quality; (3) reduce adverse wildlife impacts and provide more cover and habitat; and (4) protect the health of farmers and their families and neighbors by reducing the need to handle toxic materials. And, from a social point of view, LISA can: (1) foster resource stewardship; (2) promote farming systems that can reduce levels of pesticides, drugs, and nitrate residues in food and water; (3) provide more business and employment opportunities in rural areas to support more diversified production patterns; and (4) contribute to supply control farm income stabilization programs.

The diverse concerns that LISA can address and the multiple benefits it can produce makes it an attractive alternative to a number of groups concerned with the externalities produced by conventional agriculture. The New Agenda coalition has begun to recognize the ideological and policy overlap between many of its major objectives and the central tenets, practices, and goals of LISA. Thus, we are beginning to see a number of traditionally nonagricultural interest groups advocating the inclusion of LISA in agricultural policy. This broad-based support of the New Agenda presents a number of policy possibilities when looking forward to legislation for the 1990 Farm Bill.

The New Agenda

The New Agenda is a loose coalition of interest groups that are concerned with the politics of food, health, agriculture, communities, and the environment. Three separate themes can be identified within these broad concerns: (1) human health issues, which are primarily discussed as they relate to groundwater contamination, food safety, and worker safety; (2) agricultural production issues as they relate to alternative agricultural practices, farmworkers, and the impact of farm ownership structure on the community; and (3) environmental issues, such as soil erosion, toxics, and wildlife, water quality, and protection of the natural resource base. Within these three themes there are several common themes, one of which is the potential of LISA as a possible solution.

The issues of human health and agriculture are complex and are constantly revealing new concerns. Since the late 1970s, it has become increasingly apparent that the nation's groundwater, once thought largely removed from activities on the land's surface, has suffered widespread and growing contamination from industrial and agricultural chemicals. While sources of industrial contamination are subject to monitoring, regulation, and remedial action under numerous public laws and Federal programs, "nonpoint sources" such as agriculture have largely escaped Federal action. The detection of persistent toxic chemicals in many water bodies has led to demand for a broader scope of nonpoint source control projects, which include agriculture.

The issue of groundwater contamination is gaining momentum because of the number of studies implicating agrichemicals in a host of acute and chronic human health diseases, including a number of cancers (Cantor et al., 1987). This information is particularly disturbing when considering that more than 97% of rural drinking water in the U.S. comes from underground sources and that over 46% of the nation's 3,000 counties have the potential for contamination by fertilizers and pesticide residues (Edwards, 1988). In California, 57 different pesticides have been found in the groundwater of 28 counties (Price, 1985). Because known groundwater clean-up methods are largely beyond the financial reach of families or communities, and assignment of liability for a "nonpoint source" of pollution such as agrichemicals is extremely difficult, identifying methods that minimize the continued introduction of agriculturally related contaminants to groundwater supplies are of primary concern. A recent USDA review of *The Costs and Magnitude of Groundwater Contamination in the United States* concluded that groundwater contamination from agrichemicals is a local problem at some level of specificity (type of contamination and types of potential responses), but a national problem in terms of extent and potential threats to the public (Nielsen and Lee, 1987) .

Food safety issues have been gaining interest over the last fifteen years and have recently come more into the forefront as recent studies have been released. Pesticide residues and residue monitoring of agricultural products are of growing concern to people beyond the regulatory and research communities. The average amount of pesticides applied varies by crop, ranging from 4 pounds per acre in walnuts to 295 pounds per acre in strawberries (Stimmann, 1988).

Concern over food safety is the latest phase of the public's evolving concern over food issues. Prior to WWII, the major food concern centered on sufficient supplies and transportation. After WWII, concerns shifted more toward packaging and making food convenient to use. With issues of supply, transportation, and convenience solved, concerns over chemicals in the human food chain and food safety emerged in the mid-1970s. These concerns have come to the forefront at the same time as other New Agenda issues with the release of such key studies as the National Research Council of the National Academy of Science report, *Regulating Pesticides in Food: The Delaney Paradox* (1987). Among other issues, the report points out the disparity between fresh and processed foods in setting residue tolerances, i.e., processed foods fall under the Delaney Clause regulation of pesticide residues, while fresh foods do not. Food safety advocates see the link between production practices and pesticide residues in food and are demanding better residue testing, questioning the human health consequences of conventional agricultural practices.

Worker safety advocates are finding increasing evidence that exposure to pesticides causes cancer, birth defects, and other health problems in humans (Wasserstrom and Wiles, 1985). Another study by Stokes and Brace (1988) found a strong correlation between the amounts of certain pesticides and death rates due to genital, lymphatic, and digestive cancers. This study provides the most comprehensive and persuasive evidence to date that pesticides cause human cancer. Worker advocacy groups point to these types of studies when they voice their concerns regarding agrichemical exposure at the work site.

The issues of agricultural practices, communities, and land ownership structure focus on how the size of a farming operation may limit the adoption of sustainable practices and how the size of farms can impact the quality of life in the local community. Sustainable agricultural practices are generally not seen as congruent with the practices of large farms because of the intensive management requirements and the polycultural (vs. monocultural) techniques (Youngberg and Buttel, 1987). Small farm and family farm preservation groups point to the necessity of retaining these types of farms in order to maintain the sustainability of people on the land and sustainable agricultural practices. Additionally, studies done in California have associated towns surrounded by very large farming operations with indicators of poverty and poor quality of life (Fujimoto, 1977; MacCannell, 1988).

Those concerned with environmental and agricultural resource base protection argue for intergenerational equity, wherein each generation is obligated to manage the environment and its resources so as to pass on to the next generation an unimpaired capacity to produce safe food and fiber. These equity concerns look at the long-term impact of the food production system on the productivity of the natural system on which it rests and at the distribution of the costs and income generated by food production (Crosson, 1986). Within this context, issues such as the following come to light: soil erosion with substantial off-site damage, as well as higher fertilization to offset erosion-based yield losses; contamination of surface and groundwater from pesticides and fertilizers; soil compaction due to use of heavier and larger machinery; depletion of groundwater supplies and salinity problems resulting from irrigation; and the loss of fish and wildlife or their habitats due to chemical runoff and conversion of forests, range, and wetlands to crops.

The New Agenda groups have formed a loose coalition and are beginning to target the 1990 Farm Bill as a vehicle for incorporating more "common good" concepts into agricultural policy. The Farm Bill is omnibus legislation that designs agricultural policy and programs for the next four to five years. Traditionally, the Bill addresses agricultural commodities and supply regulation. The only aspects of this Bill that relate to resource conservation are contained in soil conservation provisions and the new conservation reserve program that was initiated in 1985. The New Agenda groups see the ideological and policy overlap between their common objectives and the central tenets of LISA.

As these various concerns for human health, ownership structure, and environmental/resource protection begin to converge on the topic of sustainable agriculture as a possible solution, clearly understanding the concept of low-input/sustainable agriculture becomes increasingly important. Understanding the capabilities, limits, and implications of such practices is essential in effectively making policy suggestions that incorporate LISA concepts.

Constraints to the Adoption of LISA Practices

An effective analysis of how to introduce LISA practices into the 1990 Farm Bill must include a discussion of why producers have not adopted these practices and what barriers must be overcome in order for the producer to adopt these practices. As discussed previously, individual farmers' micro-level decisions regarding technical change are not independent of relative prices. The theory of induced innovation (Hayami and Ruttan, 1985) suggests that technical change is motivated by the opportunity to use less of relatively higher-priced factors of production. Empirical evidence consistently supports agrichemical-using and/or labor-saving biases in aggregate U.S. agricultural technology advance (Capalbo and Vo, 1988). Decomposition techniques also suggest that technical change has been land-saving with respect to variable inputs (Shoemaker, 1986).

After WWII, farm wage rates rose at a much greater rate than the price of agrichemicals (see Figure 1), and prices of farm machinery also rose more than those for agrichemicals (see Figure 2) (Daberkow and Reichelderfer, 1988). Thus, the conclusion can be drawn that agrichemical use has increased in response to rational, profit-maximizing behavior by farmers and the availability of labor-saving technology. However, as Antle and Capalbo (1988) show, changes in factor cost shares stem not only from factor price changes but from scale changes and output level changes as well as biased technical change. Each of these forces acts simultaneously to influence input use levels in a dynamic production process. It is particularly difficult to distinguish factor substitution, output, and technical change effects.

In addition, to induce innovation by factor prices, agricultural policies put into effect through the commodity program of the Farm Bill have posed constraints to the adoption of LISA practices. Young and Goldstein (1987) suggest that commodity programs pose a constraint to the adoption of LISA systems, not only because price supports are limited to a few program crops, but also because payments for these crops have been tied to historical production. The use of program yields on base acres to determine deficiency payment levels is seen as having provided incentives for farmers to "push the intensity of supported crops in rotations toward their biological limits" and to "fertilize and apply pesticides for near-maximum yields."

Another issue is the loss of flexibility in cropping patterns imposed by government programs. Farm programs have been criticized for causing resource misallocation and may cause rigidity in planting patterns and therefore interfere with market adjustments (Farrell and Rausser, 1985). For example, should changes in relative crop prices encourage the production of a non-program crop, a producer must consider the loss of base in any decision to modify his/her output mix. Glauber (1987) has shown that,

Figure I

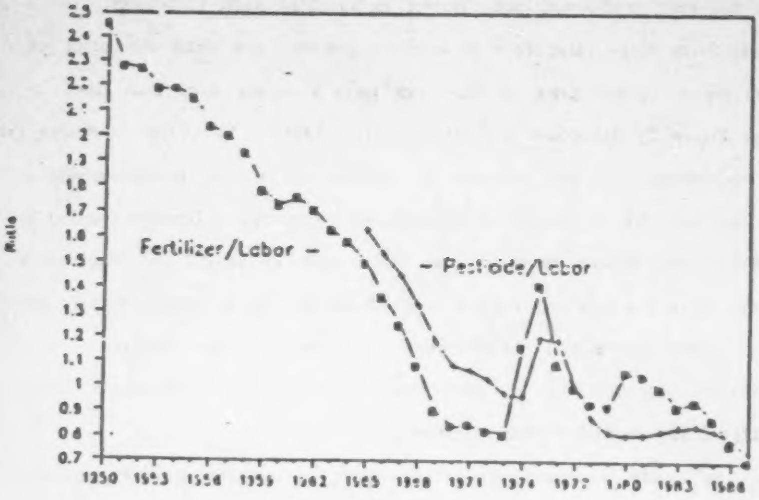
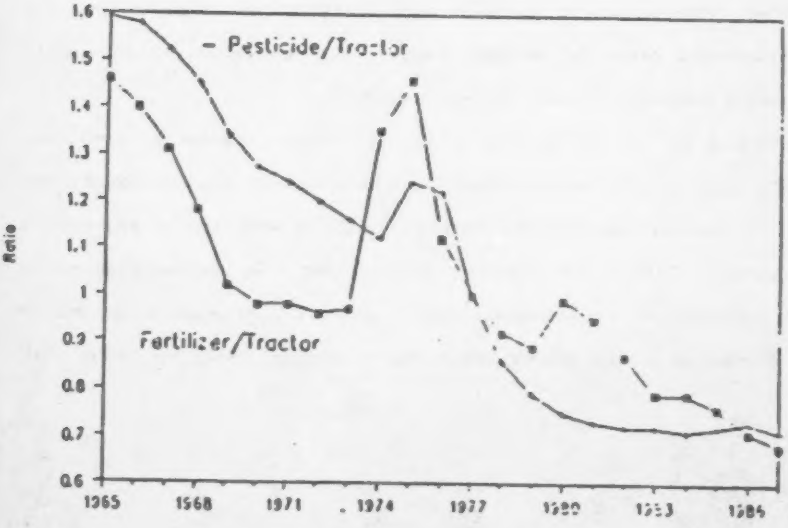


Figure 2



Source: Daberkow, S. and K. Reichelderfer, (1988).

without government programs, current soybean/corn price ratios favor soybeans. Yet because of the base loss associated with planting soybeans, Corn Belt farmers are unlikely to switch from agrichemical-intensive corn to soybeans.

Along with greater flexibility, the 1990 Farm Bill needs to broaden its elegible crop list if issues of human health and environmental quality are going to be adequately addressed. The historical purpose of the farm bill was to stabilize supply and price for a selected group of commodities, e.g., wheat, rice, cotton. This group does not include the agrichemical-intensive fruit and vegetable crops. The inclusion of these crops in a 1990 Farm Bill LISA program would incorporate broader human health concerns since consumers eat fruits and vegetables at a far greater rate than the current farm bill commodity crops. Additionally, the agrichemical-intense production methods used by fruit and vegetable crops can have extensive per-acre environmental implications. The inclusion of these crops in a LISA program would address a far greater range of environmental quality problems. An effective LISA program must begin to incorporate these crops; however, given limited resources, the inclusion of all fruits and vegetables would not be financially possible. The inclusion of some of these crops could start by selecting the top twenty-five agrichemical-intensive crops to be in the LISA program.

Other issues of credit and crop insurance can add consideration at the micro-level that influence production decisions. Lee and Chambers (1987) have shown that factor allocation decisions are linked to credit constraints. Crop insurance guidelines can require a grower to apply pesticides in order to obtain the insurance (Benbrook). Such factors can overrule the growers' other production choices.

Understanding the economic forces of production shaping aggregate input mix helps explain current agrichemical use patterns. The economic circumstances leading to and maintaining current levels of agrichemical use provide little market incentive for private development or adoption of LISA systems (Daberkow and Reichelderfer). LISA suggests adoption of rotations as a means to reduce agrichemical inputs (e.g., legumes as a source of nitrogen, which also reduces monoculture cropping, leading to reduced need for commercial pesticides). In essence, land is substituted for agrichemicals. But either output or input price ratios need to change to make this a rational decision.

If because of the externalities associated with present output and input mixes, society places a high value on the conversion to LISA, then some form of aggressive public intervention is needed. However, neither regulation nor other forms of direct intervention to change relative price signals can be expected to induce a change to LISA systems that both maintain profits and lower U.S. commodity prices to stimulate exports. Recent studies of aggregate U.S. agrichemical use found that demand is inelastic with respect to its own price, with published estimates ranging from -0.25 to -0.54 (Capalbo and Vo, 1988). This price unresponsiveness may be due to either a lack of available substitutes or the low substitutability with other inputs.

Incorporating LISA Methods Into the 1990 Farm Bill

The one area where aggressive public policy could induce change is through the Farm Bill's commodity programs. Because of commodity programs' effects on output level and mix, removal or modification of commodity program incentives would likely have the most dramatic short-term influence on the feasibility of LISA systems. Dixon, Dixon and Miranowski (1973) suggest that removal of commodity program-induced effects on crop mix and location of production could greatly reduce aggregate pesticide use.

Given the strong push by the New Agenda to look at agriculture's socially optimal input mix and to consider the externalities in agriculture's production function, a strong case can be made to incorporate LISA concepts into the Farm Bill. Miranowski (1975) found significant changes in chemical input requirements with a shift in farm program strategy. A free market scenario showed larger environmental gains than longer term land retirement or production quota alternatives, though effects on both farm income and agrichemical reduction depend upon farmers' expectations and assumptions regarding agricultural export demand. Pursuit of a free market solution can accomplish the same objective as taxation, with less intervention and positive rather than negative effects on farming profitability. Although the commodity program modifications have not typically been used to promote externality reduction, other sections of the Farm Bill pertaining to soil conservation have a long history of resource conservation and externality reduction. Adjustments in the commodity program to address issues of resource conservation and externality reduction would be in keeping with the historical concept of the Farm Bill.

To incorporate LISA concepts into the 1990 Farm Bill, legislation must include specific language that gives growers the flexibility to adopt these methods. In the 1981 and 1985 farm bills, rigid planting patterns were required. The base acreage provisions of the 1981 and 1985 farm bills limit program participants to planting some portion of a historic average of past acreage in a crop. To change this historic pattern, the producer must forego attractive program benefits. In the 1981 Farm Bill, the base was a two-year average, while in the 1985 Farm Bill, the base is a five-year average.

For effective technology innovation, changes in the 1990 Farm Bill must address the production function of producers in terms of input prices and adoption barriers. This can be accomplished by establishing a LISA program in which growers can choose to participate, similar to other existing programs (e.g., Conservation Reserve Program). The program could provide price incentives for adoption through low-interest loans, crop insurance premium reductions, and deficiency payment adjustments to use LISA methods in the production of commodities. Additional incentives for conversion to LISA methods can be generated by supplying technical assistance and marketing promotion for LISA-grown products. Growers participating in this program would be required to adopt LISA methods as deemed appropriate by their local Soil Conservation Service.

Flexibility for those producers participating in the LISA program could allow producers to devote a portion of the producers' base (historical commodity program acreage upon which benefits are calculated) to a legume or small grain/legume mixture as part of a resource-conserving rotation without losing benefits calculated on the original base acreage allotment. Thus, acreage planted to a legume or small grain/legume mixture could be considered as planted acreage for the purpose of calculating the farm's crop acreage base. This flexibility would remove a large disincentive for adopting LISA methods.

This type of LISA program within the 1990 Farm Bill would have multiple policy benefits:

1) it provides induced innovation incentives for the adoption of LISA methods;

2) it is policy efficient by addressing a number of concerns of different interest groups, e.g., water quality, environmental protection, food safety;

3) it is management intensive, an aspect which will maintain and may increase employment in the agricultural sector;

4) it is surplus-reducing and land extensive because of the use of rotations. Unlike the 1981 payment-in-kind program (PIK), which paid growers to idle extensive tracts of land with disastrous consequences to input suppliers, most input suppliers (e.g., equipment dealers and seed companies) should be minimally affected since land will still be in production. Agrichemical dealers will definitely be affected, however. This program will also retain flexibility for growers to respond to demand for increased production because, unlike the Conservation reserve which puts acreage into permanent cover crops for ten years, acreage will still be available to expand their commodity production in response to market forces; and

5) it provides a link between agricultural production policies and long-term resource conservation and provides a vehicle by which to address pressing environmental and human health issues.

The inclusion of a LISA program in the 1990 Farm Bill would provide multiple benefits and would enable U.S. agricultural policy to address an array of human health and environmental issues. While a LISA program is not a single solution for all of the complex issues surrounding agricultural externalities, it does offer direct and concrete steps towards reducing the use of agrichemicals. The development of a LISA program thereby would establish a stronger interface between U.S. agricultural policy and broader societal goals.

Footnotes

[1] Clark Edwards, *Agricultural Outlook*, USDA, Economic Research Service, May 1988, p.17.

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FARM BILL 1990: AGENDA FOR THE ENVIRONMENT AND CONSUMERS

PREPARED STATEMENT OF CENTER FOR RESOURCE ECONOMICS; NATURAL RESOURCES DEFENSE COUNCIL; NATIONAL AUDUBON SOCIETY; NATIONAL WILDLIFE FEDERATION; SIERRA CLUB; PUBLIC VOICE FOR FOOD AND HEALTH POLICY; AMERICAN FARMLAND TRUST; INSTITUTE FOR ALTERNATIVE AGRICULTURE; NATIONAL CENTER FOR APPROPRIATE TECHNOLOGY; AND CONSUMER FEDERATION OF AMERICA

Mr. Chairman, distinguished members of the committee:

Thank you for the opportunity to testify on resource and environmental issues in Federal agricultural policy.

This year, Congress is scheduled to write a law that will form the foundation of American agricultural policy for the coming decade. In the past, farm bill debates have been dominated by the issues of commodity prices, farmer incomes, and the budget. But the boundaries of that debate are changing. Environmental interests were instrumental in developing the landmark provisions for soil and wetlands conservation contained in the Food Security Act of 1985. A consensus is building across the country that farm policy in the 1990's must further protect the Nation's precious natural resources, and respond to consumer preferences for food produced in ways that reduce health and environmental risks.

Each farm bill cycle influences farming practices on hundreds of millions of acres of land for years to come, with profound impacts on soil, water, wildlife, and other natural resources. This influence has been profound in the 1980's as a result of massive government intervention to support commodity prices and farmer incomes. When the 1985 Food Security Act expires at the end of this year, net outlays for the programs it authorized will have exceeded $87 billion. In the decade of the 1980's, net outlays have exceeded $148 billion.

Farm bills likewise affect the food all of us eat: its safety and quality, its supply and price, its availability and variety.

In short, anyone concerned about the environment or the safety of the food supply should be concerned about the 1990 farm bill. We are here today because farm policy is environmental policy *and* consumer policy. We believe the measure of success for the 1990 farm bill should be how well it balances farm, environmental, and consumer interests. We further believe that this cycle of farm policy presents an unprecedented opportunity to enact badly needed and long overdue reforms of agricultural policy—reforms that will mutually benefit the environment, consumers, *and* farmers into the 21st century.

COMMON GROUND WITH THE FARM COMMUNITY

We do not purport to represent the views of all agricultural interests, of course. The "environmentalist versus farmer" and "consumer versus farmer" divisions that have been portrayed by some agricultural spokesmen, however, are unfortunate and misplaced. Only 2 percent of the U.S. population lives on farms; but they have much in common with the 98 percent of us who do not.

We recognize that American farmers provide consumers here and abroad with abundant, high quality, affordable food.

American farmers, by and large, have always been committed to protection of natural resources and environmental quality. They take pride in the quality of the food they produce.

We believe that the interests of environmentalists and consumers are consistent with the interests and concerns of most farmers. Today, farmers themselves want environmental and consumer policy issues resolved within the framework of farm policy. In fact, many farmers appear to be much more tolerant of regulation than had been thought. Last year, for example, the Cooperative Extension Service asked 13,000 farmers in 20 States if they agreed with the following statement: "Government should regulate certain farming practices and land uses to reduce pollution of underground and stream water." Sixty-one percent agreed or strongly agreed with the statement, with majorities in agreement in 17 of the 20 States.

Farmers and consumers alike are concerned about exposure to pesticides. And farmers are as anxious as environmentalists about contamination of ground water with pesticides. After all, farm families rely almost exclusively on ground water for drinking water. Just a decade ago, they were assured they did not face a problem. By 1988, EPA had reported that a total of 46 pesticides had been found in the ground water of 26 States as a result of normal farm usage.

We also share with farmers the conviction that environmental and consumer concerns should be addressed in ways that make economic sense to those who make their living from the land. In this regard, we wish to emphasize that we do not call

for the elimination of all agricultural pesticides by the year 1995, by the year 2000, or at any point in the future. Nor do our proposals contemplate such a possibility in regard to synthetic fertilizers. We know of no environmental or consumer organization that has proposed the elimination of all agricultural pesticides by 1995, notwithstanding recent congressional testimony to that effect by the Secretary of Agriculture.

Finally, we believe that investments to protect the environment and produce safe food should not be made by farmers alone. Many American farmers already incur significant costs to conserve natural resources, to protect the environment, and to produce a safe, abundant supply of food. Because existing agricultural markets rarely allow those costs to be passed on fully to consumers, we support government assistance that serves environmental and consumer protection in agriculture.

FARM BILL 1990: THE AGENDA IN BRIEF

Our proposals rest on the principle that public policy should encourage more farmers to adopt practical, economically sound options to reduce significantly pesticide and fertilizer use, curb water pollution, halt soil erosion, and enhance conservation of wildlife and other natural resources.

In addition, we need public policies that respond to consumers' strong preference for foods produced in ways that reduce worrisome risks to human health and the environment. For example, about half of America's consumers are willing to buy organic foods, even if it costs more, according to 1988 and 1989 Louis Harris polls. New food marketing polices are needed that will give farmers the incentives and opportunities necessary to produce foods in ways that meet the demand.

New policies in the 1990 farm bill are essential to dealing with environmental, consumer, and resource conservation problems facing agriculture in the decade ahead. The report released in February, *FARM BILL 1990,* proposes reforms in five related categories that, taken together, would promote a sustainable, productive future for the American food system.

1. Establish Source Reduction Goals and Programs for Agriculture.—A national policy for source reduction or "pollution prevention" should formally be made a central feature of U.S. agricultural policy. The policy and its goals should set American agriculture on a course that will reduce substantially the generation of major agricultural pollutants by the year 2000. The resources and policies of the Department of Agriculture, from its research budget to its commodity program rules, should be revised to implement this national policy over the next decade to achieve maximum environmental benefits, while protecting farmers' economic interests.

National source reduction goals should be achieved through policy reforms modelled after the successful soil conservation package created by the 1985 farm bill. The components would be as follows (pp. 17–19 of *FARM BILL 1990*):

- Recordkeeping for pesticides and nutrients, with surveys to determine patterns of usage in agriculture.
- An incentive program to encourage experimentation and accelerate adoption of source reduction measures in areas with identified surface or ground water quality problems.
- A planning process that, over a 10-year period, will enable farmers to reduce the use and generation of potential pollutants within priority areas of documented or potential water quality impairment by pesticides, nutrients, organic waste, or sediment. These plans would be developed by 1995 and be implemented by 2000. They would be structured to emphasize low-cost, practical, site-specific practices already in use by many farmers. *Pesticides and nutrients can be used more efficiently in ways that benefit farm profits, the environment, and consumers.*

For pesticides, examples include scouting fields for pests and weed mapping to determine whether a pesticide is needed prior to application, banding of herbicides rather than treating the entire field, crop rotations, application of compounds at reduced rates, tillage in lieu of herbicides.

For nutrient management, examples include soil and plant tissue testing, improved timing and accuracy of fertilizer application, fertilization to meet reasonable yield goals, crediting the nutrient value of manure, and crediting the nutrient value of legumes in rotation.

The plans would take account of pollution prevention practices farmers are already using at the time the plans are prepared. The planning process would help focus research and technical assistance on areas and commodities for which farmers have few practical, economically viable options to accomplish substantial source reduction without drastic changes in their farming operation.

Erosion control planning under the conservation compliance policy, the model for the planning activities contemplated in our proposal, is generally accepted by farmers. The 1989 Cooperative Extension Service survey mentioned earlier asked 13,000 farmers in 20 States this question: "Should soil conservation and water quality compliance be a condition for receiving farm program benefits?" A 60 percent majority of the respondents answered "Yes" (with a majority in all 20 States). Another survey conducted last year by the Soil and Water Conservation Society in 15 counties found that the vast majority viewed the plans as reasonable and practical. They also said that the plans would have little or no adverse impacts on their profits. And 54 percent of the 900 farmers support conservation compliance as a way to protect ground water.

2. Build on the Conservation Title of 1985.—Existing policies linking farm program benefits to conservation should be strengthened and enforced. Specifically:

- Producers who participate in farm programs in one year should be obligated to abide by sodbuster, swampbuster, and other conservation requirements for 5 years to retain their full program eligibility.
- Loss of farm program eligibility under swampbuster violations should be triggered upon drainage of natural wetlands, whether or not the land is then planted to commodity crops.
- A primary administrative role should be given to the U.S. Fish and Wildlife Service in determining and enforcing the swampbuster provision, and all aggrieved parties should be given the means to challenge administrative decisions affecting swampbuster, sodbuster and related natural resource requirements.
- Farm Credit System entities and other agricultural lenders benefiting from Federal backing should require their borrowers to adhere to sodbuster, swampbuster, and other environmental requirements, just as borrowers from the Federal Farmers Home Administration must do now.
- On conservation reserve fields, erosion rates should be held within tolerable levels if the land is cultivated after contracts expire.
- Sodbuster, swampbuster, and other environmental compliance policies should extend to producers benefiting (via processors) from the dairy price support program.
- The Federal Farmland Protection Policy Act and its enforcement should be strengthened to protect important agricultural lands from imprudent development.

3. Provide Incentives for Environmental Stewardship.—Establish a program to fund:

- Purchase of voluntary easements to protect existing wetlands, restore former wetlands, and establish buffer strips along pollution-sensitive water bodies.
- Multiyear management contracts to help farmers improve agrichemical management, reduce sediment discharge, and better manage animal waste in water quality problem areas.
- Cost-sharing for animal waste management facilities.

4. Promote Sustainable Farming and Reform Food Marketing Policies.—Our report urges prompt action by Congress and the Department of Agriculture to:

- Reform Federal commodity and crop insurance programs to eliminate, within the next farm bill cycle, biases against environmentally sound crop rotations and source reduction techniques.
- Reform Federal food grading standards and marketing orders to reduce emphasis on cosmetic appearance of fruits and vegetables, in order to reduce pressure for unnecessary pesticide use. Consumers should be given access to the process of establishing food grading standards. Strong national standards should be established for organic foods, and these standards should be implemented through rigorous labeling and certification, accompanied by an aggressive consumer education and promotion program for organically grown food.

5. A Research and Education Infrastructure for Environmentally Sound Agriculture.—Within the farm bill and related appropriations legislation, Congress and USDA should:

- Greatly expand competitive grants research and other federally supported research programs on sustainable farming systems, input-efficient farming and integrated pest management.
- Expand and upgrade Federal technical assistance capability in support of source reduction, natural resource conservation, and sustainable farming.

This testimony does not claim to address the full spectrum of environmental and consumer concerns that are certain to be raised in the 1990 farm bill. We believe, however, that it represents the essence of those concerns. We hope that consumers

and environmentalists from across the country will join in the 1990 farm bill debate, so that the law that emerges will reflect the broad public interest in food and agricultural policy.

Mr. Chairman, thank you for this opportunity to testify.

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